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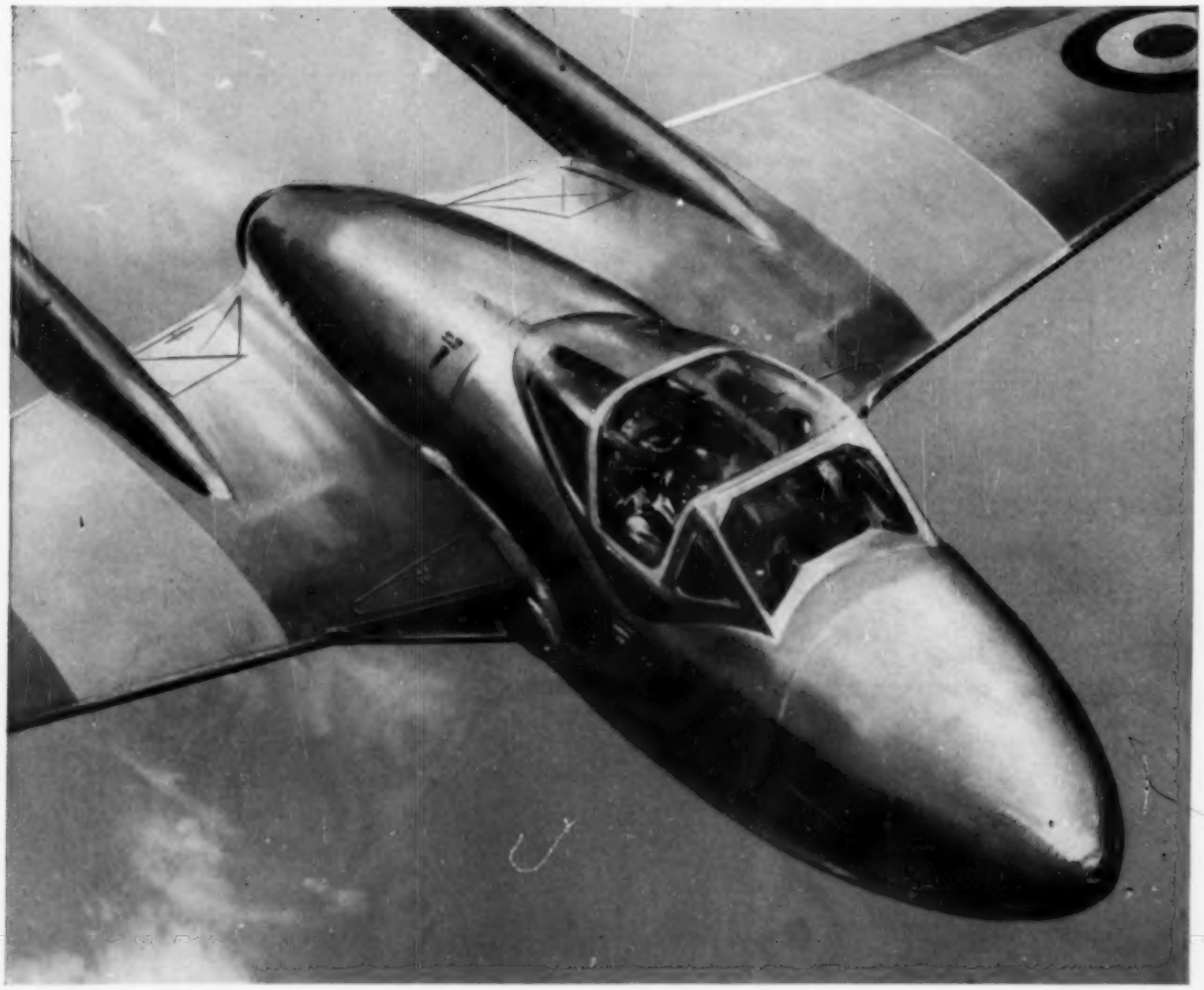

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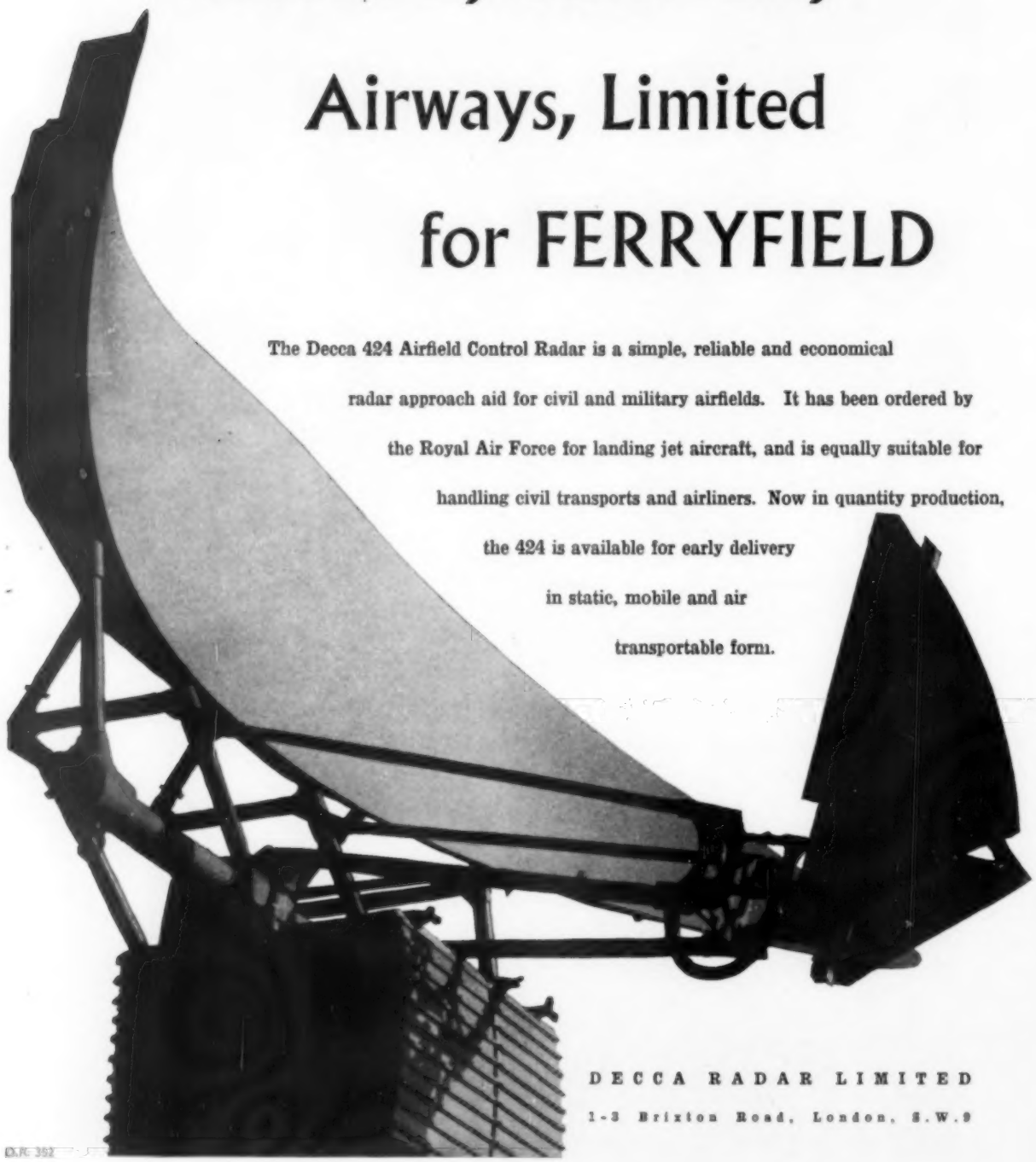

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SPECIFICATION

Operating Conditions	**−45°C. to + 70°C.**
Vibration	**To BSS G. 100**
Acceleration	**To BSS G. 100**
Weight	**13¼ lbs.**
Connections	**From intervalometer—5 pin climatic proof breeze plug. From A.C. supply—4-pin climatic proof breeze plug.**
Voltage	**Operating—24 volts D.C. (nominal). Load 4.5 k.V.A. at 208 volts, 400 cycle, three phase A.C.**
Operative D.C. pulse	**½ second.**

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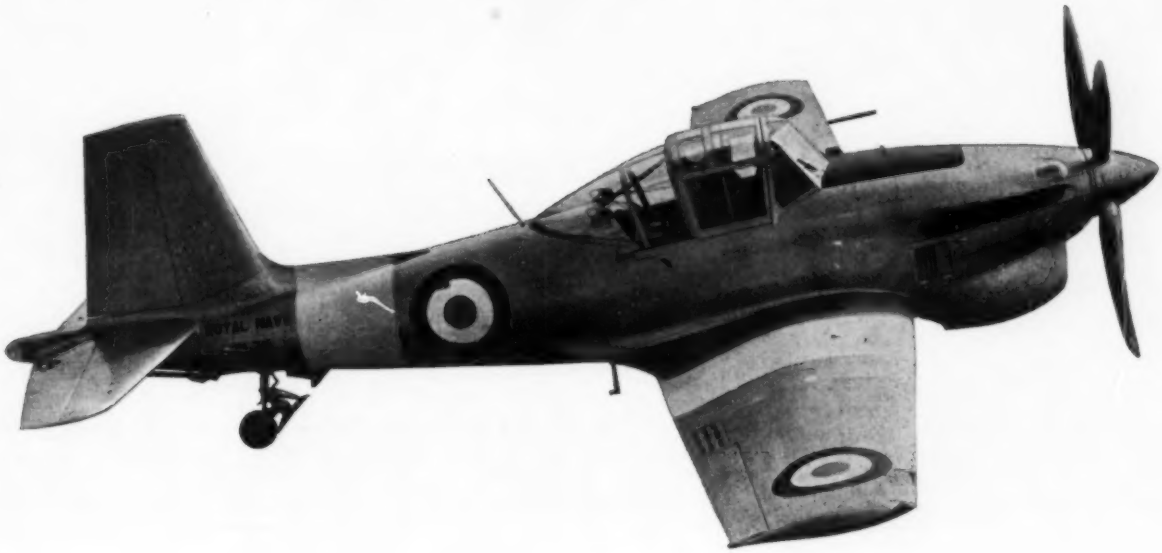

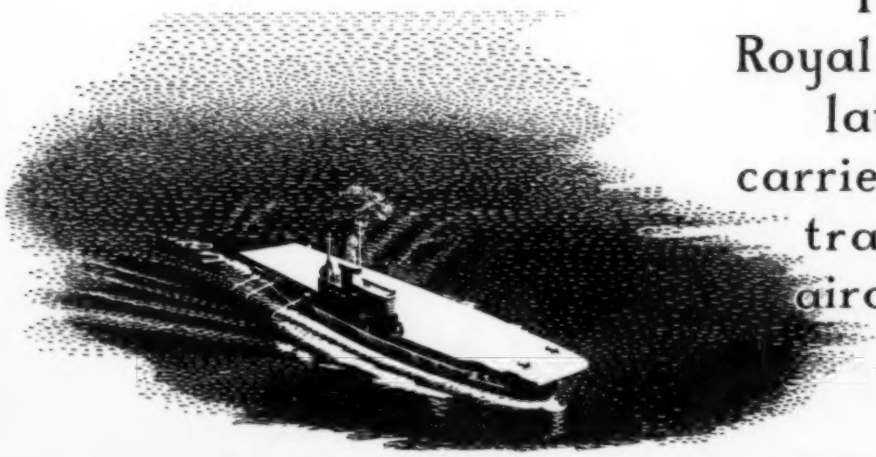

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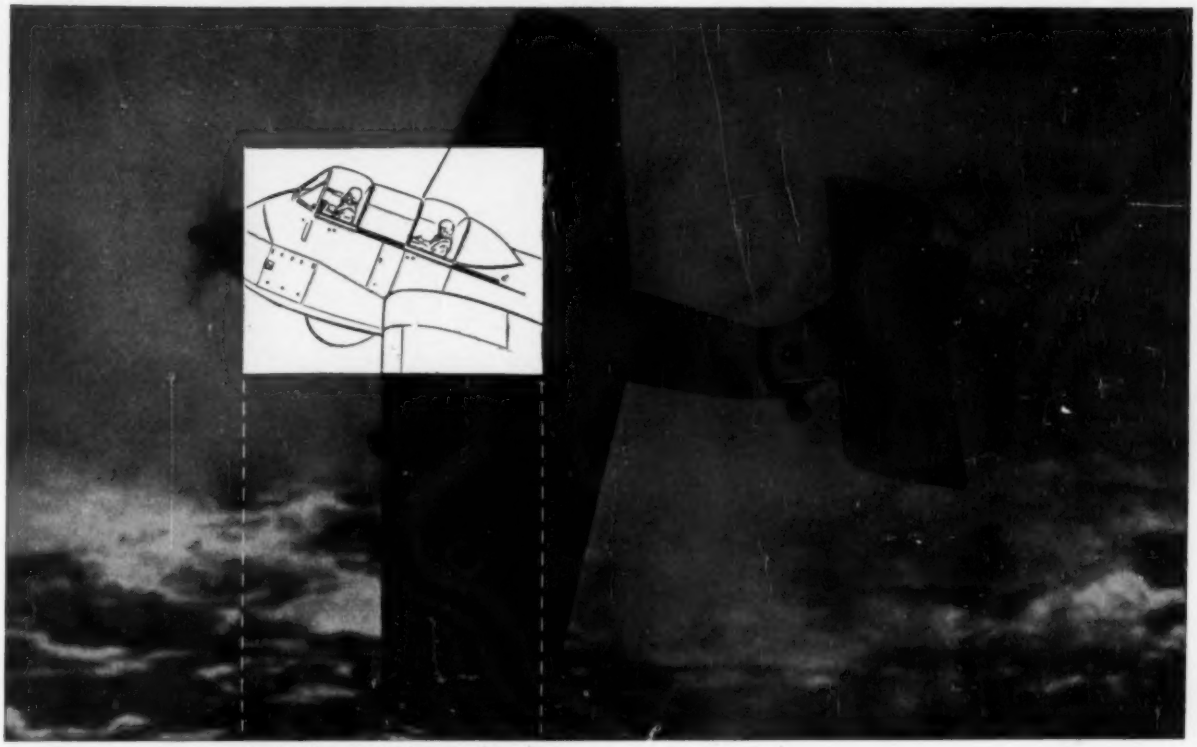
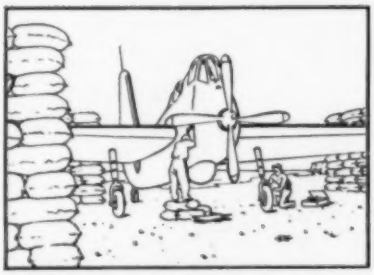
Submarine weather—*Seamew* weather



Simple to fly—even in adverse weather—the Seamew gives the pilot all-round visibility. Stalling and landing speeds are low. The fixed piston-action undercarriage absorbs the shocks of landing on a rough-and-ready airstrip.



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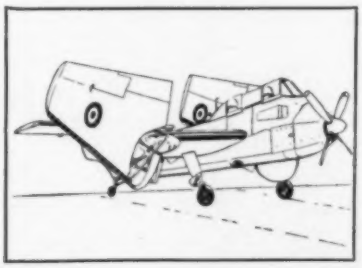

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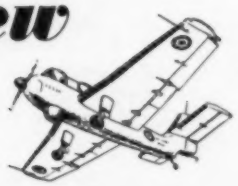

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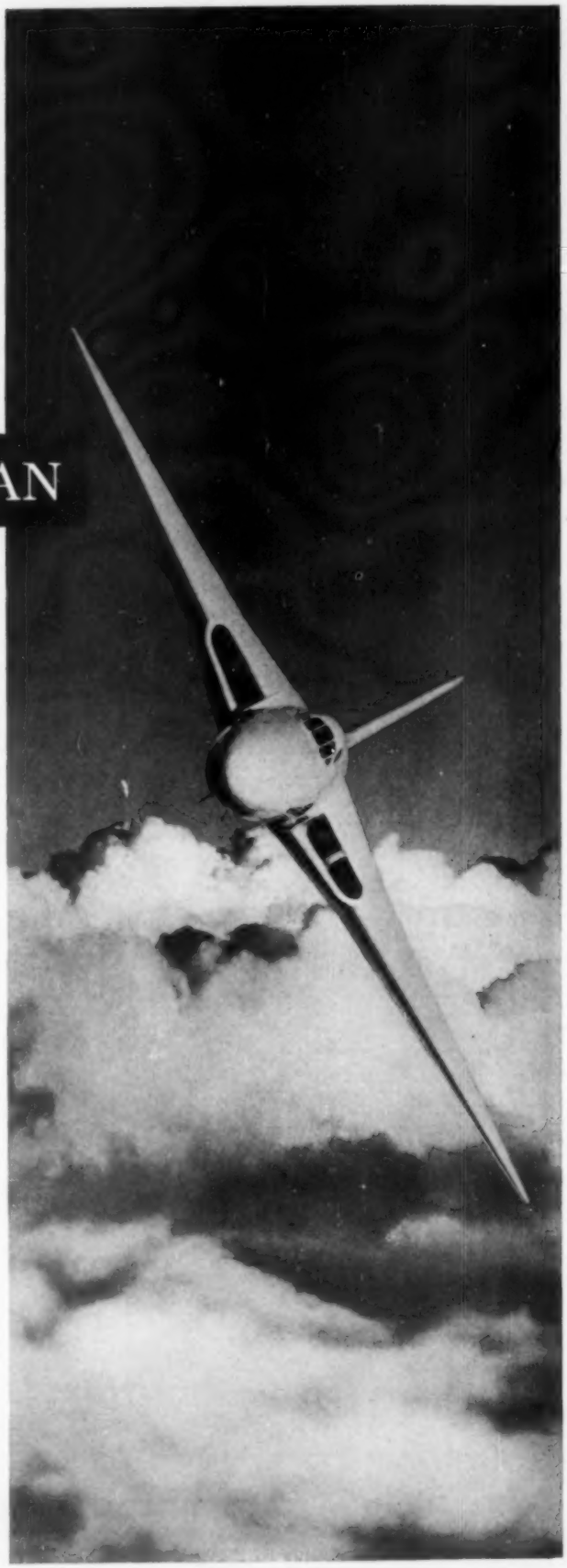

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Founded 1909

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What Noise Annoys?

WE do not recall having had the pleasure of meeting Alderman Sir Arthur Howard, chairman of the General Purposes Committee of the Westminster Council, but we would congratulate him upon some of his balanced and sensible answers to questions upon helicopter noise. He said that the "initial impact" of the helicopters landing on the South Bank rotorstation was disturbing and distracting, but it was impossible to say "how long it may be before we may acclimatize ourselves to it." He also remarked that cars had to have silencers, and it might be appropriate to have something on these lines for helicopters, so as to reduce any possible nuisance to a minimum. Earlier he had stated that no member of the council would wish to stand in the way of useful and desirable development.

The Alderman has a responsibility to residents and those working along the riverside at Westminster, but he did not allow himself to take a narrow or one-sided view of the new noise problem.

Having read many of the letters and articles on aircraft noise we have not found it difficult to sort chaff from grain. The newspapers contain a considerable number of valueless contributions from people whose lives have been largely devoted to the production of words on paper and who cannot get out of the habit. Other letters merely serve to indicate that there are quite a number of very selfish people who wish to push their portion of the nation's noise on to anyone else. Only a few face the problem squarely, fairly and try to make helpful suggestions.

A glance at the address of *Flight's* offices will indicate that we have some right, as well as a duty, to discuss the helicopter noise problem from more than one standpoint. The South Bank site is only a few hundred yards away, and the river bank is even closer to our buildings.

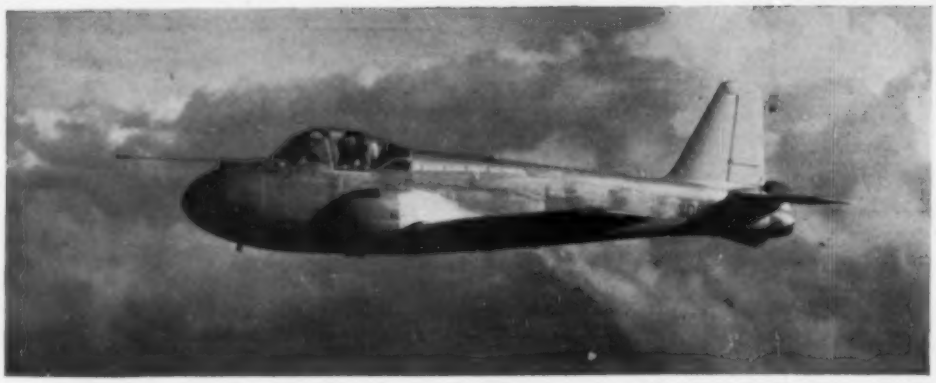
Let us consider again the remarks of Alderman Sir Arthur Howard. Is noise a thing one can get used to? Most certainly it is; people all over the country learn to sleep well within a few feet of passing express trains, city-office workers in narrow cobbled streets soon become oblivious to the clatter and roar of traffic. Many a clerk in a factory works undisturbed in a glass-walled cabin surrounded by whirring and thrumming machinery. First then, let those now affected by helicopter noise along the river and in the Westminster area assume that it will have to go on and see if they cannot grow sufficiently accustomed to it in a reasonable time for it to become submerged in all the other noises of city, road, rail and river. Many have already been spared the equally loud and irritating tramways noises, since these fearsome antiques were finally and belatedly removed. (Our apologies to Sydney, N.S.W., where new tracks are just being laid.)

Next let those who are concerned with helicopter operations continue to study every possible means of reducing the noise nuisance by intelligent routing, height selection and siting of landing areas. Sound deflecting and deadening screens (landing pits, perhaps) may prove practical possibilities.

Finally we would appeal to helicopter manufacturers to take this noise problem seriously—more seriously than some of them took our earlier requests and suggestions on the subject. (The leader "Hushing the Helicopter," *Flight* of November 14th, 1952, followed talks during which we advocated a degree of silencing—foolishly it seems—to almost deaf ears.) Aero engines cannot be silenced entirely without unacceptable power and weight penalties, but exhaust noise *can* be reduced.

It has not passed unnoticed that the helicopters visiting London just now are small with less than 750 piston-produced horse-power each. Plans are in hand—and in fact future commercial developments depend upon—40-seaters with at least two power units of twice this output. As for blade tip-jets, they will produce another new, though not necessarily more penetrating, noise.

If a cliché-cum-mixed metaphor may be pardoned, none of us can stem the tide of progress, so we must leave the hangar doors open and decide to become acclimatized. Alleviate the discomfort by any reasonable means, but put the red flags back in grandpa's garage.



BASIC REACTION . . . The Jet Provost formating on a photographic aircraft during its first flight, thus demonstrating something of the confidence which Mr. "Dick" Wheldon must already have felt in the machine.

FROM ALL QUARTERS

Jet Provost Flies

THE first prototype of the Hunting Percival P.84 Jet Provost made its initial flight at Luton on June 26th in the hands of the company's chief test pilot, Mr. R. G. "Dick" Wheldon. The new aircraft, serial-numbered XD 674, has been developed from a p.v. design, and has been constructed in very good time. It consists of standard Provost T.Mk.1 wings and empennage, suitably strengthened and matched with a fuselage housing an Armstrong Siddeley Viper ASV.5 (1,640 lb thrust) in its rear section; the standard Provost side-by-side cockpit is retained forward of the leading edge. So far the machine has not been painted, and temperature-sensing probe and control-position indicators are in evidence. The undercarriage is of nose-wheel type and of long travel to allow for the tail-down landing attitude.

In service the Jet Provost would carry the same equipment as its piston-engined counterpart, but would, for the first time, allow pupils to be trained entirely on jet aircraft. The Service-trial batch of Jet Provosts was ordered in March, 1953.

It is noteworthy that during the three days after its first flight the Jet Provost took the air no fewer than seven times, and the pilot reported no serious troubles. Though obviously not being flown to the limits, the take-off was—as we ourselves observed it—quite short, and the rate of climb good. The Viper sounds not unlike a small Sapphire.

A. V. Goes Back

IT was hard to convince oneself that the spruce, alert gentleman with whom one was talking Avro 504s by the old Brooklands track last Monday had been there some 46 years ago as the young A. V. Roe, and was then experimenting with his towed gliders and his 24 h.p. biplane. But he was indeed; and the story of his efforts—long since written into aeronautical history—was recalled on the same occasion by Mr. T. Gammon, director and general manager of Vickers-Armstrongs, Ltd. (Aircraft Division).

At Mr. Gammon's invitation, Sir Alliott unveiled a plaque commemorating his early efforts—and they were efforts in the true sense, though one would judge from what Sir Alliott told us that they nurtured much of the humour still bright in his eye.

Mr. Gammon described Sir Alliott as a man whose exploits will live in history long after those who once considered him a nuisance will be forgotten. He it was who experimented with the flying-scale-model technique which is bearing fruit today; and he, too, was the first man to design and construct a power-driven aircraft in Britain.

The first tests of the Antoinette-Avro biplanes were made on June 8th, 1908, down the finishing straight at Brooklands, and it was considered by some that during these early tests "A.V." became the first Englishman to be airborne in this country, though this distinction is not officially recognized. The outcome of his first full-scale experiments led him to design a successful tandem triplane, and from this stemmed other triplanes which accomplished some delicate manœuvres. With his brother H. V. Roe, he founded the great aircraft firm which still does honour to the family name. In the same year an Avro seaplane —the first British-designed aircraft of its type—was tested, and in 1912 there followed the first enclosed cabin machine. Thereafter came the Type 500 and—one of the very greatest aircraft of all time—the 504 (Sir Alliott was interested to hear that this type will be the subject of a forthcoming detailed description in *Flight*). In 1928 he acquired an interest in S. E. Saunders, Ltd., and later founded Saunders-Roe, Ltd., of which company he is still president. He was knighted in 1929.

At Mr. Gammon's invitation—and with no suggestion of the simpering false modesty which can spoil such occasions—Sir Alliott mounted to the base of the plinth to unveil a plaque which reads:

From this area on various dates in 1907-8 A. V. Roe made a series of towing flights and flight trials with an aircraft of his own design and construction, powered in the later trials by an 18/24 h.p. Antoinette engine.

These trials were made along the finishing straight of the motor-racing track on this site.

A. V. Roe thus became the first of the long line of famous pioneers and pilots of many nations who made air history on this flying field of Brooklands.

This tablet was placed here in June 1954 by Vickers-Armstrongs Aircraft Division and was unveiled by Sir Alliott Verdon-Roe then in his 78th year.

In a brief address Sir Alliott recalled how, as a third engineer voyaging off the South African coast in 1902, he was impressed by the gliding powers of the albatross, and became convinced that he could build an aeroplane driven by a propeller. Some of his early experiments, he said, entailed taking a clothes-basket-full of models to the top room of the house and launching them into the garden. He persevered with his experiments on Lea

REMEMBRANCE OF THINGS PAST: (Left) Sir Alliott Verdon-Roe unveils the memorial plaque to his early exploits at Brooklands (as described on this page) at the invitation of Mr. T. Gammon (right). The second picture shows Sir Alliott installed in a B.E.A. Bell helicopter with First Officer John Reid, while Capt. O. P. Jones, Senior Pilot of B.O.A.C., gives the pair a benign send-off. "Flight" photographs

Marshes, and it was there that he received a letter from a young lady, informing him of her intention to commit suicide. To that end she requested the services of his aircraft. He replied that, since he was then engaged in the construction of a new machine, she might be well advised to wait for its appearance, as this might give her something to live for.

Such was—and is—the spirit of Alliott Verdon-Roe.

To Guide British Industry

THE Council of the Society of British Aircraft Constructors elected the Society's officers and management committee for 1954-55 on June 23rd. The new President is Mr. J. J. Parkes, A.F.R.Ae.S., and the vice-president is Mr. C. F. Uwins, O.B.E., A.F.C., F.R.Ae.S. Mr. H. Burroughes, F.R.Ae.S., who was president for 1952-54, becomes deputy president, and Sir Frederick Handley Page, C.B.E., has been re-elected honorary treasurer.

Mr. Parkes is chairman and managing director of Alvis, Ltd., and chairman of Alvis Mechanisation, Ltd. He has been the Society's vice-president since 1952, a council member since 1946 and a member of the management committee since 1949. Learning to fly at the de Havilland school in 1926, he served with No. 601 Squadron, R.Aux.A.F., joined Airwork in 1929 as technical manager and test pilot, and, in 1935, was appointed

Mr. J. J. Parkes and Mr. C. F. Uwins, elected president and vice-president respectively of the S.B.A.C.

de Havilland's general manager at Stag Lane, where he worked until he joined Alvis in 1946.

Mr. Uwins, who is managing director of the Bristol Aeroplane Company's Aircraft Division and director of the Bristol Aeroplane Company (Australia) Pty., Ltd., was for many years the company's chief test pilot. He received the Britannia Trophy for his world height record climb to 43,976ft in a Pegasus-engined Vickers Vespa in 1932, and he was the first recipient of the British Silver Medal for aeronautics. He is chairman of the S.B.A.C. test pilots' committee, and has been a member of council since 1952.

The elected members of the management committee are: Mr. A. F. Burke, O.B.E.; Mr. H. T. Chapman, C.B.E., Capt. E. D. Clarke, M.C.; Sir Roy Dobson, C.B.E., J.P.; Mr. T. Gammon, O.B.E.; Mr. W. T. Gill; Mr. H. G. Nelson; Mr. J. D. North; Mr. F. E. N. St. Barbe; Sir Frank Spriggs, K.B.E.; and Sir Reginald Verdon Smith, J.P. Nominated representatives of the associate members are: Group A (suppliers of materials), Mr. G. W. Lacey, C.B.E.; Group B (equipment), Messrs. S. W. Hughes and L. A. Morgan.

Vickers 1000 Ordered

LATE last week the Secretary-of-State for Air, Lord De L'Isle and Dudley, announced that the Vickers Armstrongs Type 1000 would be the future standard long-range transport of the British Services, in succession to the Handley Page Hastings. He said that "a Government order" had been placed which would enable the company to begin economical production in series.

This is momentous news. Apart from re-affirming faith in high-speed, high-altitude transports, it marks a welcome change in the status and relative importance of military air transport on a global basis, which in this country has always been puny in strength compared with the immense logistic formations wielded by the American Air Force, Navy and M.A.T.S. It undoubtedly is a result of our need to make the utmost use of what military power we have so that, in Lord Nathan's words "a new model Army" can be made available within a day at the farthest corner of the earth, irrespective of the state of normal lines of communication.

MILITARY AIRCRAFT—REPRINTS

IN SPITE of the much increased print order, *Flight's* "Military Aircraft of the World" special number was sold out almost immediately it appeared. We regret that many would-be readers have been disappointed and we are now glad to announce that the main military aircraft review feature is being reprinted and will be available in two weeks' time. Orders should be placed with newsagents and booksellers, price 2s 6d, or sent direct to *Flight* (2s 9d including postage).

It was in February last year that the Ministry of Supply authorized Vickers to go ahead on the construction of a prototype 1000. This aircraft is already recognizable, and the observer cannot fail to be impressed by its size. It measures no less than 146ft in length—more than any other transport, in service or projected, except for the lone Convair C-99—and the span and height will be, respectively, 140ft and 38ft 6in.

A low-wing, single-deck machine, it owes much to the Valiant; but, in addition to being much bigger than the bomber, it is also designed to cruise faster, if angle of sweepback is any criterion.

The scheduled power units of the new giant are four Rolls-Royce Conway by-pass engines, buried in the inner wing.

The prototype 1000 certainly ought to fly next year, and may be an impressive show-piece at the 1955 S.B.A.C. Display. A civil airliner derivative, styled V.C.7, is also projected, and will obviously be brought nearer to production by the Service order.

It is not clear who will operate the Type 1000s; a logical assumption would be that they would become the strategic backbone of the Royal Air Force Transport Command, but Lord De L'Isle and Dudley avoided assigning the aircraft to any particular Service. It has been pointed out that five 1000s could transport an infantry battalion to Kenya within 18 hours. The probable seating capacity will be for some 120 troops, and special loading arrangements, including an internal lift, will be provided for handling all kinds of stores. The stage-length quoted is 2,500 miles with full load.

—And More Beverleys

DURING the same debate—on the Army estimates, in the House of Lords—Lord De L'Isle and Dudley said, of the Blackburn and General Aircraft Beverley "We placed a substantial order for this type last year, and having reviewed the future and the increasing importance of adequate air transport for the Army we have decided to place a further order for this type."

Franco-British

WHILE he was at the *Centre d'Essais en Vol* at Bretigny (roughly the equivalent of Boscombe Down) the Duke of Edinburgh is reported to have asked to be shown all French types of which there are no British equivalents. He saw the Potez 75, Hurel Dubois H.D. 31, Sipa 200 Minijet, S.O.1220 Djinn, S.E.3120 Alouette and Fouga Magister, and he also inspected examples of the Mystère 11 and 1VA on the ground.

An engineer and three R.A.F. pilots from the A. and A.E.E., Boscombe Down, have arrived at Villacoublay to study the tiny Sipa 200 Minijet. Using prototype No. 02 they completed over 15 hours' flying in 16 flights over a period of five days, without mechanical trouble.

OTHER AIR NEWS

HELICOPTERS of the U.S.A.F. spent last week-end in keeping 262 stranded railway passengers supplied with food. Heavy rains washed out rail and road bridges near Langtry, Texas, cutting off the Southern Pacific's *Sunset Limited*. As we went to press, the Air Force were evacuating the passengers and train crew.

ORIGINALLY scheduled for last Wednesday, the first flight of the small shaft-drive helicopter developed by Mr. John Murray, of Salford, Lancs, has been postponed. Mr. Murray is anxious that there should be no failure when his machine is eventually demonstrated at Manchester's Barton Airport.

INDICATIVE of their interest in high-aspect-ratio wings is the decision by F. G. Miles, Ltd., to convert an Aerovan to a "Hurel Dubois" layout, with a metal wing of very small chord. Miles are already planning production of the big H.D. 32.

REPRESENTATIVES of the Australian Department of Supply and Defence Production recently inspected production of the Handley Page Victor medium bomber. Giving this news, Handley Page re-affirm that the design figures for the Victor are "more stringent than for any other V-bomber."

ACCORDING to the Brisbane *Courier-Mail*, the 30 mm guns of the Commonwealth CA-27 Avon-Sabre each have a rate of fire of 1,250 rounds per minute. These have previously been described as Adens, which are the new standard fighter guns of the R.A.F.

CELEBRATING: A formation of Mig-15 or 15bis fighters over Tushino Airport on the occasion of Soviet Air Day (June 20th), described in our preceding issue. Objects in the region of the dive brakes suggest a recent modification; otherwise the machines follow the now-familiar pattern.

FROM ALL QUARTERS . . .

Avro Canada Facts

ON a short visit to this country last week, Mr. Crawford Gordon, president of Avro Canada, spoke briefly of the CF-105 and the new turbojet engine being developed by his company. He confirmed that the CF-105 is to be a twin-engined, delta-wing, long-range all-weather fighter, especially designed for operation in arctic-circle conditions, but would not comment on the figures published recently in *Aviation Week* (which quoted a gross weight of 52,000 lb, a speed of M = 2, and a thrust of 20,000 lb from each engine), except to say that the new fighter would be capable of supersonic speed in level flight. The prototype would be powered by American engines—but not J65 Sapphires.

Avro Canada's new engine, Mr. Gordon stated, was thought to be the most advanced power plant being developed at present, and was of axial-flow type. A main feature would be its saving in weight, due to the extensive use of titanium, in co-operation with the Canadian Steel Improvement company, recently acquired by the Hawker-Siddeley Group. This company has just produced prototype quantities of blades forged in titanium alloy with such accuracy that no machining, other than polishing, is required over the face and back of the blade. It was hoped that this engine would power other aircraft in addition to the CF-105.

The Valenciennes Meeting

THE airfield of Valenciennes-Denain was the scene last Sunday of a characteristically French air meeting—lively, enjoyable and edifying. Star turns included Mme Jacqueline Auriol (Ouragan), Marcel Doret (Dewoitine D.27), and Michel Berlin (Stampe). L'Armée de l'Air was represented by the Patrouille de France (Ouragans), and by three Dakota-loads of parachutists; the Belgian Air Force by F-84s and the redoubtable Capt. Bodard in his Meteor; and the R.A.F. by a Canberra and the aerobatic flight of No. 64 Squadron (Meteors). Notably spirited performances were put up by S.N.C.A.S.O. Djinn compressed-air-driven helicopter (Jean Dabos) and the Potez 75 anti-tank aircraft (Jacques Noetinger). Having dived beyond the speed of sound in a Mystère II, test pilot André Tesson was killed when he had to abandon the aircraft and his parachute failed to open.

SWEET MYSTERY: The first off-shore Marcel Dassault Mystère IV fighter was displayed as shown on the occasion of its being handed over to the American authorities at Bordeaux/Merignac last Saturday week. The power plant is a Hispano-Suiza-built Rolls-Royce Tay, and the two guns are also Hispano-Suizas—of 30 mm calibre.

MIL STREAM: Some of the 44 Russian assault helicopters which, as described last week, participated in the Soviet Air Day Display at Tushino. These machines are of a type first seen at the Tushino Display last year, and are attributed to the Russian designer Mil.

The Flying LST

NOW in large-scale production at the San Diego, California, factory of the Convair division of the General Dynamics Corporation, the Convair R3Y-2 is a notable advance on the earlier R3Y-1. Bearing the same name—Tradewind—the new boat has a nose-opening door 8ft 4in wide and 6ft 8in high, through which a great variety of military equipment can be taken aboard.

The R3Y-2 has a hull of advanced form, with a length/beam ratio of 10 to 1. In its 146ft length is a completely unobstructed stowage space, heavily pressurized and air-conditioned, with a main deck of extruded magnesium sheet measuring 88ft by more than 9ft wide. Some indication of the immense value of the boat can be gained by the possible loads: 103 removable, rearward-facing seats; 92 litters and 12 attendants; four 155 mm howitzers; six jeeps; three 2½-ton trucks; or 24 tons of general cargo. In addition to the nose doors there is a 10ft-wide door on the port side.

The crew of five have a self-contained compartment built into the roof (as in the Bristol Freighter and Blackburn Beverley). For assault operations the new Tradewind will taxi on to the beach under the power of the four 5,500 h.p. Allison T40 double turboprops; when the hull touches ground, the nose door (which has a "thimble" radome at the extreme bow) opens upwards, a ramp is dropped, and the load is disembarked forthwith. On the return, reverse-pitch is used to clear the beach, after which a 30-second run lifts the 80-ton boat into the air. Rate of climb and cruising speed exceed those of most piston engined fighters; in fact, the R3Y is certainly the fastest large airscrew-driven machine in the world. Both the R3Y-1 and 2 will be in service with the U.S. Navy Fleet Logistic Air Wings, Pacific, later this year.

The R3Y-2 was illustrated on p. 813 of last week's issue, and a drawing appears on p. 18 ("Aircraft Intelligence") of this issue.

RETURN TO SCAMPTON

No. 27 Squadron Canberras Complete their Goodwill Tour

THE six Canberra B.2s of No. 27 Sqn which have been engaged on a good-will tour of six European countries, returned to their base at Scampton, Lincs, on June 24th. Judging from the sunburnt faces of the crews and from their accounts of their travels, the tour was an unqualified success. A.V-M. J. R. Whitley, A.O.C. No. 1 Group, Bomber Command, who led the force reported, that at every stage the reception had been all that could possibly have been desired, and nowhere more so than at Belgrade, their penultimate point of call. The Canberras themselves had also behaved perfectly, and all returned to England in good condition, still carrying unused in their bomb bays the major portion of the spares with which they first left England.

The various stages of the tour have been reported in *Flight* as it progressed, up to last week's report of the visit to Belgrade. From Belgrade the team flew to Malta, where they night-stopped; they then continued to Gibraltar and made their last call at Lisbon. They finally returned to Scampton from Lisbon in one 2 hr 24 min flight (reaching Start Point 1 hr 50 min after take-off) and buzzed the airfield one after the other in the space of three minutes; they had taken off at short intervals and flown individually.

Five Canberras originally left Scampton, four from No. 27 Sqn under their commanding officer S/L. D. H. Chopping, the fifth being the personal Canberra of A.V-M. Whitley, who led the tour; he did not, however, fly in the displays which were given at each calling point. At Rome one of the two spare aircraft which had been standing by at Scampton joined the team—not because of any failure in the other aircraft. It flew from London to Rome in the remarkably short time of 1 hr 41 min, beating the unofficial point-to-point record, and achieving an average speed of 564 m.p.h.

After his arrival back at Scampton, A.V-M. Whitley particularly stressed the warmth of the reception at every stage of the journey and the strong comradeship which exists between the R.A.F. and the many members of foreign air forces who have been trained by it. Within the ranks of the NATO air forces (all the six countries visited are NATO members) there was a very strong binding bond which was everywhere apparent. It was also noteworthy that none of these countries, as yet, possessed a jet-bomber force of its own, although American-supplied F-84s were everywhere to be seen. The visit, and particularly the demonstration by the Canberras, therefore aroused the genuine admiration of the service and civilian spectators, many of whom were with difficulty convinced that this was not in fact a special demonstration team for Bomber Command. Their surprise was only increased when further told that formation flying did not form a normal part of the pilots' training or operational routine. A.V-M. Whitley had to apologise to many of his hosts that, owing to the fact that full operational equipment was being carried, the aircraft were not allowed to perform aerobatics. It is also understood that any attempts that may have been made to intercept the Canberras on arrival or departure from the various countries visited, were not successful.

Three of the team's Canberras over the Blue Mosque at Istanbul.

The Mediterranean summer temperatures, which were first fully experienced during the visit to Greece, would have caused the crews extreme discomfort in their cockpits on the ground and during low-level flying had they not been equipped with air-ventilated undertunics. These, and salt tablets, however, staved off all ill-effects. During their visit to Turkey, which was reached on June 13th, the Canberras split up into two teams and gave demonstrations over many of the major centres of population and indulged in some very low-level flying over Istanbul harbour.

At Belgrade, interest in the Canberras was such that the public was for the first time allowed *en masse* on to a military airfield to watch the demonstration. The crews were presented with red star cap-badges which many of them were wearing on their flying suits when they returned to England.

During the Lisbon visit the crews were taken up the coast to Estoril where they bathed (the water here was reported to be colder than in any of the other countries visited) and thence up to Cintra for lunch.

This is the second foreign tour made by Canberras (the first was to South America in 1952—by No. 12 Squadron) and the first in Europe. It is regarded by all to have been most successful, and to have done a great deal for British prestige. It is to be hoped that more of such visits can in future be arranged, for the benefits to be derived from them, by all concerned, has been amply proved by this second venture—perhaps even more strongly than by the first. Certainly the tactical mobility of the Canberra units cannot be doubted.

(Above) At Belgrade. Left to right are: G/C. G. F. Lerwill, D.F.C., A.V-M. J. R. Whitley, Sir William Ivo Mallett, British Ambassador, W/C. H. P. Connolly and S/L. D. H. Chopping. (Right) Taxying in at Scampton after a 2 hr 24 min flight from Lisbon.

GULL-WINGED SEA-BIRD: The U.S. Navy's Martin P5M-2 flying boat, some particulars of which were given in our special Military Aircraft issue last week, on test over Maryland. Rockets, depth charges and torpedoes are carried to deal with submarines located by the bow-mounted radar.

HERE AND THERE

Hushing the Hunters

MOBILE screens, to muffle the noise of turbojets running up on the ground, are being built for the Ministry of Supply, and the first pair will go to the Hawker airfield at Dunsfold, Surrey. Activity at Dunsfold will, of course, increase, as Hunter deliveries get under way.

H.P. Flying Observatories

ASTRONOMERS and other scientists—among them the Astronomer Royal, Sir Harold Spencer Jones, F.R.S., and Dr. Mervyn Ellison, of the Royal Observatory, Edinburgh—were to be passengers in a Handley Page Hastings of the Royal Air Force on June 30th for the purpose of observing the total eclipse of the sun. The Hastings was to take off from Leuchars, Fife, in the early morning and fly several hundred miles along the track of "totality." A B.O.A.C. Hermes, on a "re-familiarization" exercise prior to re-entering scheduled service, was to make a similar flight with astronomers aboard.

Constructors under Canvas

THIRTY-NINE engineering undergraduates from Leeds and Birmingham Universities—members of the airfield construction flights of their Air Squadrons—will spend part of their summer vacation with the R.A.F. in Germany.

A.R.A. Ceremony

DETAILS of the new wind tunnel being constructed by the Aircraft Research Association, Ltd., have several times been presented in our pages, the fullest account being that in our issue of February 12th last. The council of the A.R.A. are holding their first meeting on the site—near Bedford—on July 7th. At 3 p.m., Mr. Hugh Burroughs, Hawker Siddeley director and chairman of the A.R.A., will lay the foundation stone of the new tunnel building.

New Dunsfold Pilot

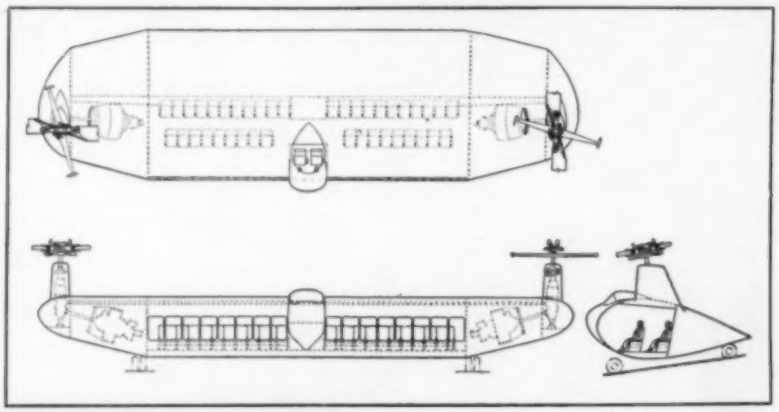
MANY pilots will be envious of 30-year-old Hugh Merewether, a South African, who has joined Hawker's Dunsfold team of production test pilots passing out Hunters. Merewether finished the war in America, where he was being trained for the Fleet Air Arm; returning to England, he took a B.Sc. (Eng.) degree at London, and then spent five years working in Vickers-Armstrongs' research department. In 1951 he joined No. 615 County of Surrey Squadron, R.Aux.A.F., and learnt to fly jet aircraft. Since then he has worked as a free-lance ferry pilot, taking Attackers, Meteors, Furies and Vampires abroad.

Faster Triangle

IT is reported that Mr. Dan Smith, C.F.I. at Dunstable and one of the British sailplane pilots taking part in the Communist-sponsored international meeting near Poznan, Poland, has set up a new British speed record for a triangular course. Flying a Polish "Jaskolka" sailplane, he achieved 37.07 m.p.h.; the previous British record was 29.21 m.p.h., by Philip Wills.

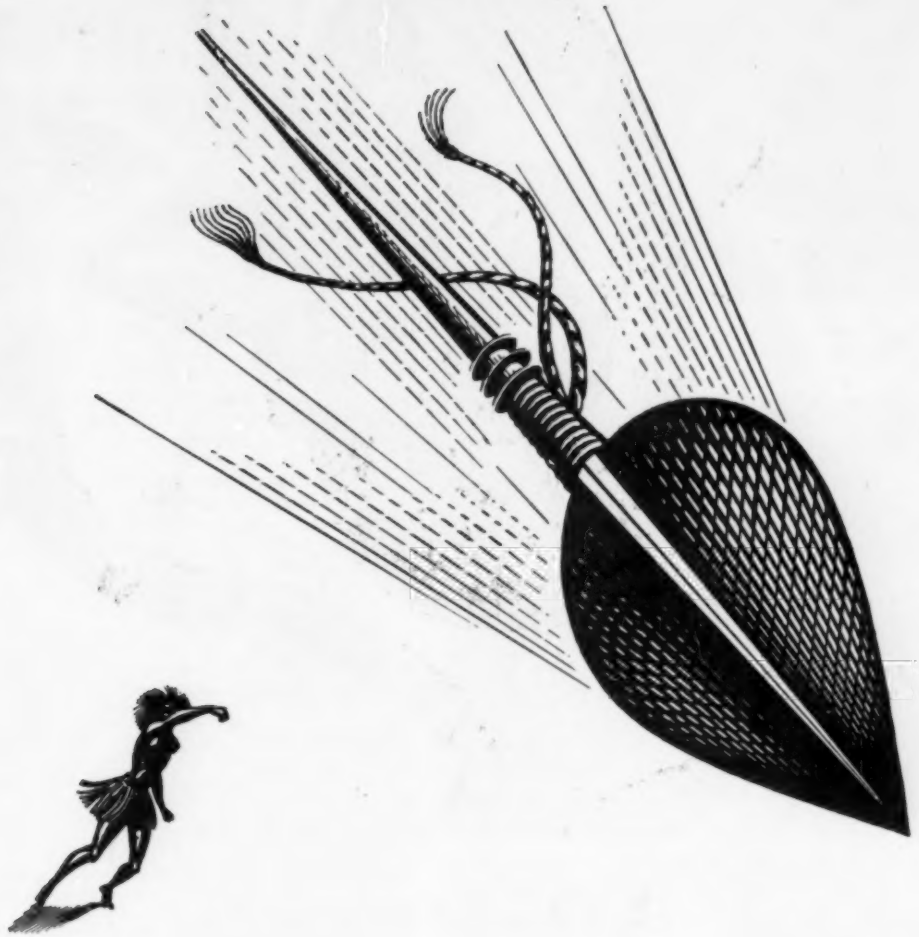
Skyways York Lost

THE crew of three were killed when Skyways York G-AGNY crashed in the Russian Zone of Germany on June 26th. Employed as a freighter on the minor Berlin airlift, the aircraft left Hamburg on a positioning flight to Tempelhof but descended in the corridor about 50 miles north-west of Berlin. The crew were named as Capt. B. S. Murphy, 1st/Off. R. Giles and Rad/Off. Z. I. Patterson.



ROOM AND A VIEW: (Above) This diagram of Bell's remarkable new helicopter shows the manner in which the power units—Wright R-1820s or Pratt and Whitney R-2800s—are mounted at the "wing-tips." For passenger transport, from 20 to 50 seats are possible. The prototype is now being built.

GRIPS EXCHANGED: Sir Thomas Sopwith, Chairman of the Hawker Siddeley Group, Ltd., accepts a vice made in the training school and shakes hands with Avro aeronautical apprentice David Brierley. Directors looking on are, from left, Sir William Farren, Mr. H. Burroughes, Mr. J. Green, Mr. J. F. Robertson, Mr. J. A. R. Kay, Sir Roy Dobson and Sir Frank Spriggs. Mr. H. Lomas, right, is apprentice supervisor.



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The Napier Eland is a propeller-turbine aero engine with an outside diameter of only 36 inches. This gives it unusually high aero-dynamic efficiency. Fuel consumption is low and its light weight permits great economies in the size and weight of both civil and military aircraft.

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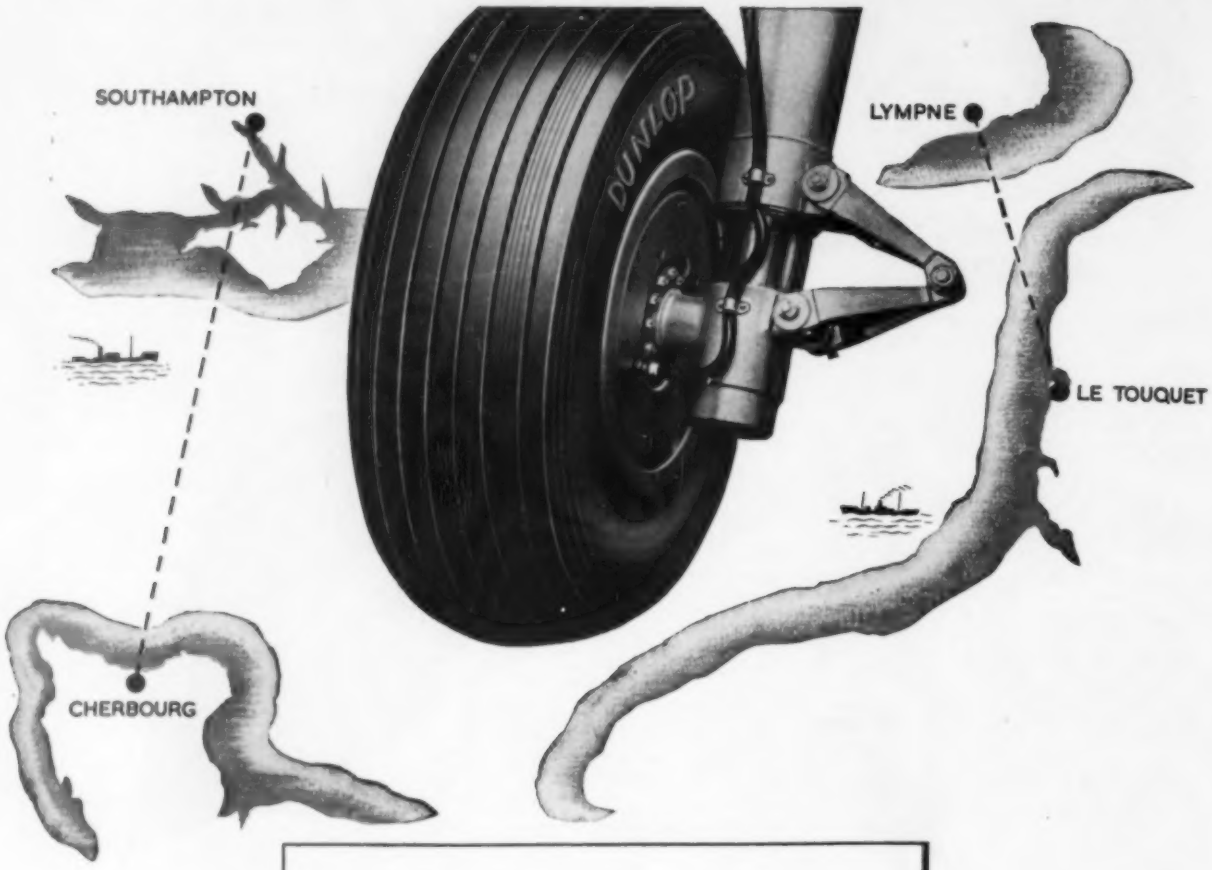

18,792 TAKE-OFFS
18,792 LANDINGS

In 1953, Bristol Freighters of Silver City Airways flew more than one-and-a-half million miles, averaging a take-off and landing every eighty-four miles. They were — and are — fitted with

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RHODESIA'S AIR ARM

New Equipment to Guard and Serve the Central African Federation

Spitfire 22s of the Southern Rhodesian Air Force on the occasion of the final wings parade before Federation, at Salisbury earlier this year.

SMALL in numbers, large in spirit and versatile in duties performed, the Southern Rhodesian Air Force has for two reasons reached a crucial stage in its existence. In the first place, as a result of Federation, it finds itself concerned with a country which has increased three times in population and territory overnight. Secondly, it is in process of re-equipping with new aircraft better suited to its needs than the variety of ex-wartime types hitherto in use. Its exact relationship and title are now somewhat uncertain and, until its new duties and responsibilities have been determined and its position regularized, the future course of development is rather obscure. Yesterday, July 1st, was, perhaps, the significant day for the S.R.A.F., being the beginning of the first financial year of the new Central African Federation.

The S.R.A.F. can boast a fine headquarters airfield outside Salisbury. The buildings, all new, were designed for their present purpose and have been occupied for about two years. The name they have given to the airfield is New Sarum, better known in commercial aviation circles by the unofficial name of Kentucky or Kentucky Farm. Eventually the local Civil Aviation authorities hope it will be known simply as Salisbury Airport (or the new Salisbury Airport) when Belvedere closes down. But there should be no mistake; the airfield is now entirely operated by the S.R.A.F. and the control tower and administrative buildings and all the hangars (these were first depicted in photographs of the Rhodes Centenary Air Rally staged there in June, 1953) are the S.R.A.F.'s. The handsome two-storey administrative block is designed to take a third floor should expansion make it necessary.

When eventually the civil side takes over part or full control, several major problems will arise. Initial flying training, for example, will have to be undertaken at a satellite airfield. Whether a second new control tower will be built, or whether the civil flying-control people will move in on the military side of the field remains to be seen.

Apparently it is due to the visit of H.M. the Queen to Salisbury and New Sarum that a good tarmac road—one of the few in the area—leads out to the airfield.

The men of the S.R.A.F. wear khaki and their Service is administered in a manner somewhat similar to that of the South African Air Force. The S.R.A.F. is under the command of Army Defence Headquarters and for what may be broadly called housekeeping it is a joint unit with the Army. Thus it may be regarded as the air arm of a joint defence force. The Chief of the General Staff is Major-General S. Garlake, C.B.E.

Passing in front of the administration building and control tower at New Sarum, Salisbury, is the first of two Percival Pembrokes so far delivered.

The Minister of Defence in the Federation is the Federal Prime Minister, Sir Godfrey Huggins. He is president of the Defence Council comprising the C.G.S., the Officer Commanding the Air Force, the Secretary for Defence and the Deputy Secretary for Defence.

There is no separate Air Headquarters and the senior air command is held at New Sarum, by Col. C. W. S. Jacklin, O.B.E., A.F.C., who was trained in Rhodesia in 1937. He accompanied the first Rhodesian Air Unit Flights which took up war stations in Kenya on September 3rd, 1939.

Next senior to Col. Jacklin is Lt.-Col. K. D. Taute, D.F.C., who is the S.R.A.F. liaison officer in London (at Rhodesia House). The S.A.S.O. is Major A. M. Bentley, O.B.E., A.F.C.,

Taken on the occasion of the Rhodes Centenary air display at Salisbury, this view shows the extent of the S.R.A.F.'s modern buildings and hangars.

RHODESIA'S AIR ARM . . .

and the S.O.A. is Major H. Hawkins, A.F.C., at present attending the R.A.F. Staff College course.

In addition to these officers there are Maj. B. H. Gibbons, M.B.E., the S.T.S.O.; Maj. R. H. Barber, D.F.C., who is O.C. S.R.A.F. Base, New Sarum; and Maj. A. O. G. Wilson, who is Air 1 (Ops.), with Capt. J. H. Deall, D.S.O., D.F.C., as his deputy. Of the other 28 captains and lieutenants we may name Capt. J. P. Moss, who is O.C. flying; Capt. E. T. C. Cunnison, D.F.C., No. 1 Sqn. commander; Capt. H. J. Pringle, O.C. M.U.; Lt. C. H. Paxton, O.C. Transport Sqn.; and Lt. J. S. McLauchlan, the C.G.I., S/L. S. J. Marriott, the S.E.S.O., with three flight lieutenants and one flying officer who had been seconded from the R.A.F. The strength of officers is thus 41 and the total of all ranks about 300.

Before the war Rhodesian pilots all also held R.A.F.V.R. commissions and were thus liable for service with the R.A.F. The ambition of the force is now to expand with the Federation and, one day perhaps, to merit the prefix Royal—becoming, possibly, the Royal Rhodesian Air Force.

A somewhat dated selection of aircraft—all of which have given good service—is now being replaced by Vampires (eight delivered), Provosts (first four about ready for delivery) and Pembroke C. Mk 1s (the first had arrived at the time of the Editor's visit and a second arrived subsequently escorting four Vampires).

One of the Vampire ferry pilots was Lt. C. Paxton who is seen in this happy shot with his young son shortly after arriving back at Salisbury.

Having suffered from the maintenance woes attending a multiplicity of types, the S.R.A.F. has taken special steps to alleviate the position. The D.H. Vampire Trainers, for example, are equipped with exactly the same Goblin 3s as are the Vampire fighters. Again, the Percival Pembrokes have the same Leonides power units as have the Provosts—including Rotol airscrews. These aircraft are progressively replacing Spitfire 22s, Harvards, Ansons, Rapides, and Tiger Moths. The Dakota will be kept and, according to the transport requirements still to be decided, another one or two may be needed.

The first duty of the S.R.A.F. is to train and hold in readiness two ground-attack squadrons, the senior or No. 1 squadron using the Vampire F.B.9s, the second working-up on the Vampire Trainer (T. Mk 11s). In an emergency the squadrons would expect to operate with the R.A.F. after re-equipment and a rapid conversion to (probably) Venoms. The Spitfires, it is thought, will finally be retired in September. Members of the S.R.A.F. would like to regain the wartime Rhodesian Squadron numbers: 266 Sqn. is an R.A.F. Venom unit now in Germany and 237 has not been reformed.

In addition to the operational squadrons there are training and transport squadrons. The latter is expected to handle communications, casualty evacuation, photographic work and "flying doctor" services as well as providing V.I.P. and ordinary service transport.

The training intake for S.R.A.F. pilots since the war has been fifteen every six months; this means that 60 should be under training at any time. In fact, wastage from all causes reduces this figure by about 17 per cent. For selection, pupil pilots must be European residents of Central Africa, have reached matriculation standard, and must sign on for two years' regular and eight years' reserve service. Some S.R.A.F. pilots have transferred to the R.A.F. after expiry of their short-service commissions.

Apprentices are also taken in at the rate of twelve per year to make a total of 36 under training. They go by arrangement with the R.A.F. to Halton and Locking. The first entry to complete the three-year course is due back in December.

At New Sarum, as lodger units, are also to be found an equipment depot and a third- and fourth-line maintenance unit.

One of the features which contributes to the extremely pleasant atmosphere at S.R.A.F. Station New Sarum—one senses it immediately—is that the units are technically wholly self-supporting, proud of their standards of workmanship, and one knows personally who will be doing each part of the work. The ratio of technical personnel to aircraft is 1.6 to 1.8. Some will recall a happy period in the R.A.F., a long time ago, when almost everyone knew everyone else. (That is not to say that the growth of the R.A.F. is to be regretted—on the contrary.)

A side line for the S.R.A.F. is the training of A.O.P. pilots for the Army. Three Austers are used for this work; one of them, incidentally, is used by the D.C.A. for field inspection work. One hopes it will not be long before the D.C.A. gets his own larger aircraft for this work—a Beaver, perhaps, in view of the good record of this type in the region. The small A.O.P. training commitment might also with advantage to both sides be sub-let to a civil flying club.

This brief review would be incomplete without a reference to the competent and attractive W.A.M.S.—the abbreviation used for the Women's Military and Air Service, of which there are nine members serving with the S.R.A.F.

New squadron equipment arrives over Salisbury after being ferried out from England. The flight was led by F/L. Upton, R.A.F., in a Vampire T.11 which, in the top photograph, is seen peeling-off before landing. (Centre) After flying out from the U.K. on a Vampire delivery flight, Lt. M. Schuman talks with ground crew of the S.R.A.F. On the left, a Vampire Trainer on loan from the R.A.F. is examined by pupil pilots of the S.R.A.F. who expect soon to be flying similar aircraft.

Specially painted for Armstrong Siddeley, Roy Nockolds' abstract design portrays the tremendous power/speed potential of the Sapphire turbojet.

Chosen to power an impressive list of aircraft for the air forces of the N.A.T.O. powers — the Sapphire develops over 8,000 lb. thrust. With its small frontal area, resulting from an annular combustion chamber, the Sapphire blends well into the aerodynamic forms of supersonic aircraft.

★ ***THE SAPPHIRE*** *is being manufactured under licence by the Wright Aeronautical Division of the Curtiss-Wright Corporation in the U.S.A., where it is known as the Wright J-65.*

The Hawker
HUNTER *F.2 fighter*

The Gloster
JAVELIN *all-weather fighter*

★ *The Republic F.84F*
THUNDERSTREAK *fighter*

The Handley Page
VICTOR *crescent-wing bomber*

★ *The*
MARTIN B57 *(Canberra) bomber*

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FERRYFIELD

First Details of Silver City's New Cross-Channel Terminal

"FLIGHT" Photographs

An artist's impression of Ferryfield as it will be within the very near future. Services from the new airport are due to begin on July 6th.

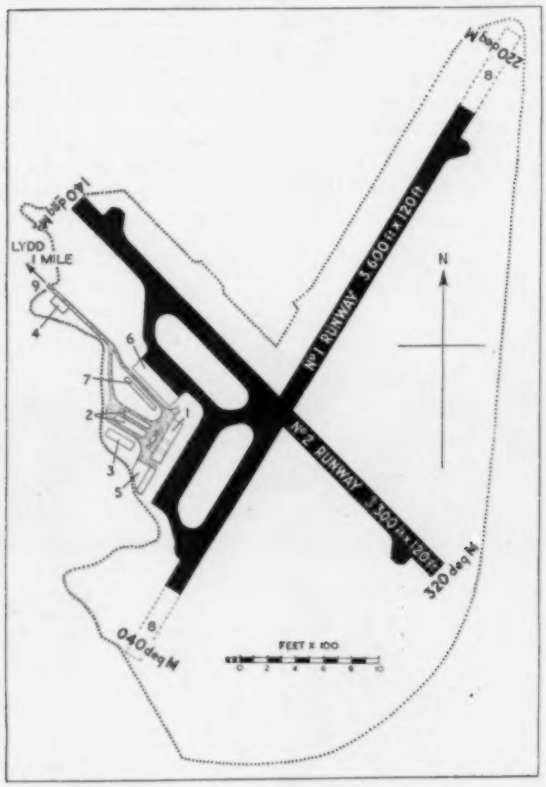
FERRYFIELD is the crisp and appropriate name chosen by Silver City Airways for their privately built airport near Lydd, Kent. Although neither large nor expensive by today's standards, Ferryfield is unique in many respects. To our mind the most outstanding feature of the whole project is the speed and drive with which it has been carried through.

The decision to build Ferryfield was announced last July, and the site was selected two months later. Final approval of plans for the terminal building and runways was given on December 14th, and Silver City's contractors (Richard Costain, Ltd.) began work on the site a few days later. Despite heavy rain which slowed-up runway construction, the airport was completed in all but a few details inside six months. Only finishing touches were required when we visited Ferryfield last week, and the airport was then expected to come into operation on Tuesday next, July 6th.

The construction of Ferryfield represents a chapter in the remarkable success story of Silver City Airways, who are now (on the basis of ton-miles offered) among the world's 40 leading airlines. Silver City's air ferry between Lympne and Le Touquet began on a very modest scale just six years ago. Between July 14th, 1948, and the end of that year's semi-experimental operation only 70 cars were flown across the Channel. As the service expanded fares were progressively reduced, and traffic increased to the stage where—in 1953—the airline was carrying about 23 per cent of all cross-Channel vehicle traffic. Last year's air-ferry figures were 39,041 vehicles and 96,625 passengers.

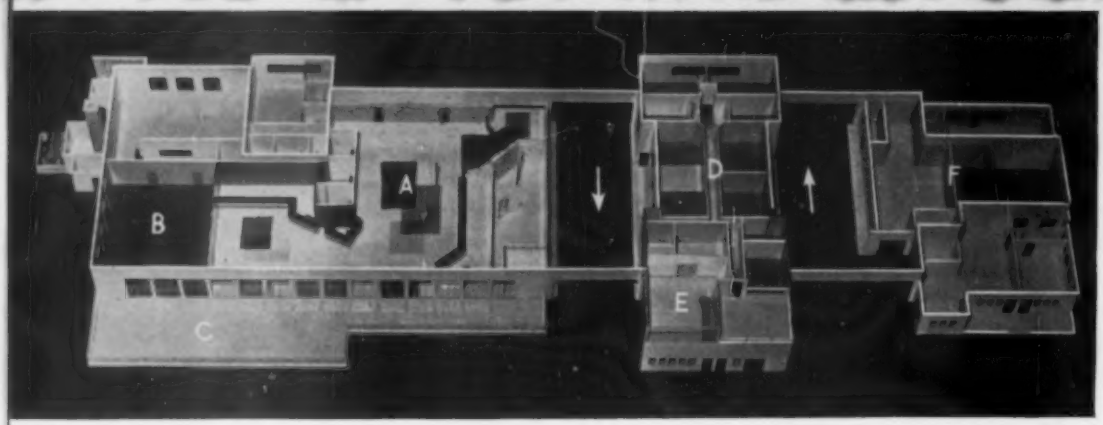
But although 1953 was a most successful year from the traffic viewpoint, some operational problems developed. Lympne is a grass field with few aids, and is subject to bad flying weather with little warning. With as many as 170 crossings daily scheduled during busy weekends, the effect of a prolonged "clamp" can readily be visualized—queues of frustrated motorists building up on each side of the Channel. Silver City admit frankly that such delays took their toll of goodwill in 1953. But for Ferryfield 1954 would have brought further problems, as the year's traffic is expected to show an increase of some 20 per cent.

Last year's operational difficulties were paralleled by a different problem with deeper roots—the question of the



(Above) No. 2 runway, viewed from the north-west. The sea, ¾ mile distant, is visible on the horizon, with Dungeness Lighthouse on the right.

Layout of Ferryfield showing:
(1) Terminal buildings; (2) car park (transit); (3) site for "motel"; (4) service station; (5) spectators' car park; (6) site for hangar; (7) workshops; (8) proposed runway extension; (9) private access road.



Key features of the terminal building are illustrated here with the aid of a model. The arrows show the direction taken by vehicles passing through the two "carways." On the left are the main entrance hall (A), restaurant (B) and sun terrace (C). Customs are centred at D, and the control tower is above the departure lounge (E). On right (at F) are company offices.

FERRYFIELD . . .

future development and ownership of Lympne. Well known to pilots in the pre-war golden age of private flying, Lympne was originally taken over by the M.C.A. (as it then was) in 1946 as a Customs aerodrome. Following the announcement that Lympne had lost £17,000 in 1948, the Ministry made an unsuccessful attempt to sell the airport to the Corporations of Hythe and Folkestone. Silver City's car ferry was beginning to look encouraging by 1950, and the company made an offer for Lympne; this was turned down by the Ministry, presumably because of opposition to the deal by the other resident operator, Air Kruise. By the end of 1951 Silver City had paid about £30,000 in landing fees at Lympne, and although the fee was halved by the Ministry the following year it seems unlikely that operation of this fairly primitive airport has resulted in heavy losses.

During the winter of 1951 Lympne became waterlogged and for six weeks Silver City were forced to fly—most uneconomically—from West Malling and Blackbushe. In 1953 the airport was again offered to the local corporations, who considered the idea for some months before rejecting it. After Silver City had decided to go ahead with the Ferryfield project, the M.T.C.A. announced that Lympne would be offered for sale at a public auction. At this auction, held on April 29th, bidding did not reach the reserve price (reported to be £120,000). This sum is clearly based on Lympne's value as an airport capable of earning up to £20,000 annually in landing fees. As agricultural land, its maximum value is probably £20,000. In view of Silver City's declared intention to develop Ferryfield while continuing to operate from Lympne, it might have been more logical to fix a lower reserve price at the auction. As things stand, the value of Lympne will dwindle in proportion to the rate of development at Ferryfield.

The Ministerial approach towards Lympne appears to have been apathetic and indeterminate from the outset. We are still not quite certain why the M.T.C.A. decided to sell an airport which probably lost less money than any other. The only official explanation, given some months ago, was that Lympne was not considered part of the integral pattern of U.K. airports.

Ferryfield is stated to have cost about £250,000, although future developments such as extension of runways and hangar construction will entail further outlay.

The new airport is situated about a mile from Lydd, near the tip of the Dungeness peninsula, and ¼ mile from the sea. It has flat, open approaches to the two runways. The air distance to Le Touquet is 42 miles, so the Lympne-Le Touquet and Lympne-Calais flying time of 20 minutes will also be maintained on the new route.

The first step taken by the contractors was the construction of a 1¼-mile access road to enable heavy plant to be moved on to the site and, later, to connect the terminal building with the B.2075 road from New Romney. Visitors to Ferryfield will notice by the side of this road the new Shell-Mex and B.P. fuel storage tanks, with capacity for 30,000 gal of 100 octane aviation spirit and 5,000 gal of 73 octane for motor vehicles. Refuellers have been supplied by Derby Aviation, Ltd.

On the "land" side of the low-lying terminal building is a park for 100 cars; there is a second car park for spectators nearby, together with the site for a proposed "motel." Measuring 300ft wide by 100ft long, the terminal building is a simple, functional structure of steel clad in white-covered concrete blocks. It is the first terminal designed to handle both vehicles and passengers simultaneously and, as shown above, is divided into three main sections by covered "carways" (ingoing and outgoing).

On the right (as seen by the arriving passenger) is a spacious concourse building with a glazed wall looking on to a sun terrace and the loading apron beyond it. On the left of the

Two stages in construction of the Ferryfield runways. Gravel was mixed with concrete and moistened (above); the "stabilized" layer was then compacted, levelled and, where necessary, covered with tarmac (left). The central section of the terminal building (right) is seen shortly before application of the white external finish.

When this "Flight" photograph was taken last week, the terminal building was all but completed. A white external finish should produce the attractive appearance suggested by the artist's impression on page 9. On the opposite page the building is shown, from a similar angle, in model form "with the lid off."

main entrance hall is the ticket desk; on the right, R.A.C., A.A. and Lloyds Bank offices. Continuing to the right, after checking-in, the passenger finds a shop, lounge, buffet and restaurant. The light effect given by the glazed wall and roof windows is coupled with excellent contemporary interior decoration. Signposting is especially clear and effective, and well in advance of anything previously seen at British airports.

When his flight number is called, the passenger walks across the outgoing carway, where his vehicle has been brought for Customs inspection, into the centre building. In this section are sited Customs and Waterguard offices, and both arrival and final departure rooms.

The incoming carway separates the centre section from a third building housing an M.T. garage, crew room, freight store and briefing room.

Only the centre building has a second floor, containing company offices and air traffic control staff. The tower windows give a three-way view of both runways and there is an open-air terrace to complete the controller's field of vision. The control desk, built up to Silver City's requirements by Racal, Ltd., is simply and attractively laid out.

Mounted on the desk are, reading from left to right, a display-type control panel for the airfield lighting; a plastic sheet on which weather and visibility information can be written for quick reference; a panel of instruments showing wind direction and speed, and barometric pressure; a small rack for slips showing aircraft movements; and a map of the area. In front of the controller is the V.H.F. panel. Ferryfield's radio installation consists of three transmitters and three receivers providing two operational sets and a spare. Three channels will be operated: 126.1 (airport R/T. and V.D.F.); 120.5 (*en route*); and 121.9 (ground-movement control). The homing aid is an M/F. beacon (call-sign FL).

Ferryfield will be the first airport on Silver City's routes to use radar. At an approximate cost of £6,000, a Decca 424 system has been installed, to give both route and approach coverage. The scanner is remotely mounted between the intersection of the runways. From this position, covering Silver City's route altitudes of 1,000-2,500ft, the 424 has a range of 16 miles. When a similar set is installed at Le Touquet there will be almost complete radar coverage of the entire operation. It is possible that all the aircraft will later be fitted with responders to permit constant identification.

Azimuth information is presented on two P.P.I. scopes in the radar operator's cabin; one scope will be used for area control and the other for talk-down approaches. The Decca cabin takes the form of a small annexe to the main control room, from which it is separated by Arctic-blue light filters, so that the controller can pass from one to the other without blinking at unaccustomed light or peering into sudden darkness.

The runway system takes the form of a St. Andrew's cross, with taxi-tracks, loading apron and terminal buildings all concentrated in the angle formed on the western side. The main runway, 3,600ft long, with a 500ft hardened "stopway" at each end, will probably accept about 90 per cent of the landings (from the N.E. direction). Reference to the plan on page 9 will show that an aircraft landing on 04 will reach the apron with a minimum of taxying on completion of its landing run.

A speedy and economical method of runway construction was employed. Runway foundations consist of an 18in layer of shingle and gravel. This was compacted by heavy steel sledges fitted with high-frequency vibrators. The second layer consists of 9in of gravel on which cement was spread. These two materials were moistened and mixed simultaneously by a machine impressively known as a "single-pass stabilizer with rotary, paddle-type blades." Further treatment with the vibrating roller produced a firm, level layer, 6in deep, of "stabilized gravel."

Two types of covering are employed: a 1½in layer of tarred stone to resist abrasive action at points where aircraft will turn; and, for other parts of the runway, stabilized gravel paving spread with tar and gritted with fine sand and small stones. At present the runways have a sandy appearance and do not stand out well from the surrounding shingle. In time, however, grass and weeds will provide a contrasting setting for the runways.

Ferryfield will be operated by a staff of about 150, under airport manager D. Kinnear, formerly the airline's station manager in Berlin. Silver City will, of course, be acting in an unaccustomed rôle as airport owners, and a subsidiary known as Ferry Airports, Ltd., has been formed to handle this side of the business.

From July 13th, all Le Touquet services (departing normally every half hour, and at more frequent intervals during peak periods) will operate from Ferryfield. Lympne will continue, at least until the end of the year, as the base for the Calais and Ostend services. Should the M.T.C A. decide to close Lympne, Ferryfield will presumably take over all its previous functions, not only as Silver City's main operating terminal but as the major south-east Customs-clearance port for light aircraft. Meanwhile, the new airport, with better weather characteristics, runways, radio and radar facilities, will provide the ferry operators with an excellent "alternate" for Lympne services whenever circumstances require diversion at short notice.

The construction of Ferryfield was a bold and enterprising step, typical of such Silver City personalities as chairman E. C. Mekie and managing director A. Cdre. G. J. Powell.

THOUGHTS on SOARING

A Second Opinion on Auxiliary Engines and Ultra-light Designs

By G. H. LEE

THE article by Mr. Walter Neumark on "The Future of Soaring" (*Flight*, May 14th) requires, in my opinion, a reply. The major part of his contribution is based on what I believe to be a false premise, which is then developed by reasoning not wholly sound (and, at times, by irrelevant and inapplicable analogies) to conclusions, with which I profoundly disagree, on the important subject of amateur flying. Mr. Neumark's attractive and persuasive style adds to the need for a rejoinder.

The fundamental point on which I disagree is the assumption that what the amateur flier wants is just hours in the air; I submit that this simply is not true. Anyone who travels much by air will tell you how boring such transport soon becomes; and this same fact is shown by the tedium which continued hill soaring, without the hope of better things, produces in anyone who does an appreciable amount of soaring. The commodity which the aeronautical amateur wants, and for which he gives his time and money, is something which I can only call Aerial Delight, to enjoy which hours must certainly be spent in the air; but they must be properly spent.

The nature of this delight varies from one man to another, but I feel that, as in nearly all our sports and pastimes, the joy of overcoming difficulties and dangers, and the sense of personal achievement, counts for much. This sense will be enormously diluted if there are two pilots in the machine. Thus a two-seater, though it may double the "aviator-hours," may well reduce the real, essential attraction to such a degree that no amount of two-seatering could balance the equation, any more than it is possible to equate the pleasure of, say, one Lobster Newburg by a large number of portions of fish and chips.

The fallacy of the two-seater argument becomes clear if it is logically extended further; if two-seaters, why not three-seaters, or four-seaters, or twenty-four-seaters? When you get to this stage the whole thing becomes clearly absurd. The introduction of a motor, especially one startable in the air (as advocated) would still further reduce the enjoyment-content —for, as Mr. Neumark says in his introductory paragraph, the exhilaration of cross-country soaring lies in the fact that ". . . every minute and mile are achieved by his [the pilot's] correct understanding and use of atmospheric up-currents . . . often reaching well into the stratosphere." Put in your little engine and all that goes right out of your life.

With regard to the ostrich, dodo and penguin, to call these birds "over-specialized purists" is a question-begging bit of trickery. The word "purist" refers to a state of mind or ethical standards and I am prepared to bet that Mr. Neumark has never had the chance of asking any of these birds whether or not their intentions were honourable; and, anyway, the ostrich and penguin are still doing pretty well, even though the dodo is proverbially dead.

To come now to one or two more detailed points, I will fulfil Mr. Neumark's expectations and disagree with his estimate of operating cost. Although his figure of £3 or £4 per hour for flying cost is plausibly derived, the fact is that present costs are about £2 per hour, based on the annual expenses (including depreciation) and flying time for one of the major clubs in the country, operating post-war aircraft. To add-in incidental expenses such as those for travelling is, I think, unfair, since these vary so largely with individual style of living; and, in any case, some such expenses are always incurred at weekends or holidays, whether you glide or not. Granted that soaring is not very cheap and agreeing that it would be wonderful to make it cheaper, I still fail to see how Mr. Neumark can justify his claim that present annual hours for pilot and machine "do not justify the effort, time and money invested in the sport." How does he know if the returns justify the investment or not? Can he really put a price on the joy and satisfaction of having done just one good flight?

The picture of transcontinental touring by powered two-seaters has undoubted attractions, even though such transport would be unreliable because of the dependence on weather. However, history has always shown that the aeroplane with a very small engine is doomed to be developed out of existence. Several times a small-engined breed has appeared and always the process has been the fitting of bigger and better engines until a more or less conventional light aeroplane emerges. The causes are firstly, I think, the fact that (as I have suggested) the ultra-light aeroplane appeals only to so very few; and, secondly (as pointed out by Mr. Neumark himself) that the best overall economy does not always correspond to the cheapest aircraft.

Having so largely disagreed, let me now say that on one main point I entirely concur with Mr. Neumark; soaring is expensive and, as he so rightly points out, the main way of reducing costs is by better utilization. In my view the approach lies not in powered two-seaters but largely in improving the efficiency of ground handling and launching at clubs. Motor transport and winches are often in very poor and unreliable condition; this fact, combined with bad organization (or lack of organization), results in massive delays and monumental frustration. I believe that by attention to these matters, including retrieving, hourly costs could be cut by one-third, perhaps more. It is now realized by glider manufacturers that costs of new machines are too high and I am confident that efficient sailplanes with performances as good as, say, an Olympia, can and will be produced for much less than the price of one of those machines; so again costs will fall.

I found Mr. Neumark's data on midget sailplanes most intriguing and I am full of admiration for Herr Blessing's Kobold, though the thought of having to trundle a 2½ cwt wheelbarrow to the nearest station after a hard day's flying must be rather daunting to even the hardiest cross-country pilot. With regard to the Tondokuro III, I find it hard to believe that proper strength factors could be reached on a 32½ft-span machine for 50lb structure-weight. I do not necessarily mean that such a machine could not fly, but I doubt if it could be a fully operational sailplane capable of flying safely in clouds and of leading a full life aeronautically.

Despite my disagreement with Mr. Neumark's thesis, may I thank him for writing the article? The reflections that it will engender will, I am sure, be of benefit to aviation.

FOKKER EXPANSION

FROM the Fokker organization comes news of considerable expansion. The main factory is being enlarged by the addition of a new machine shop and large flight-hangar. The Fokker concern, which employs over 3,000 workers, now consists of the following sections: Main office and factory at Schiphol Airport; Avio-Diepen repair shop at Ypenburg Aerodrome, near the Hague; the former aircraft department of De Schelde at Dordrecht; and part of the old Fokker works at Amsterdam.

The Fokker Board of directors consists of V. J. Baron Collot d'Escury, H.R.H. Prince Bernhard of the Netherlands, Lt.-Gen. I. A. Aler, Ir. S. van West, H. W. A. van den Wall Bake, C. J. A. van Daalen and Drs. H. P. Jongsma.

Executives on the management side are H. During (financial section), Prof. Ir. E. Van Emden (technical), F. J. L. Diepen (commercial) and Ir. C. van Meerten (chief designer).

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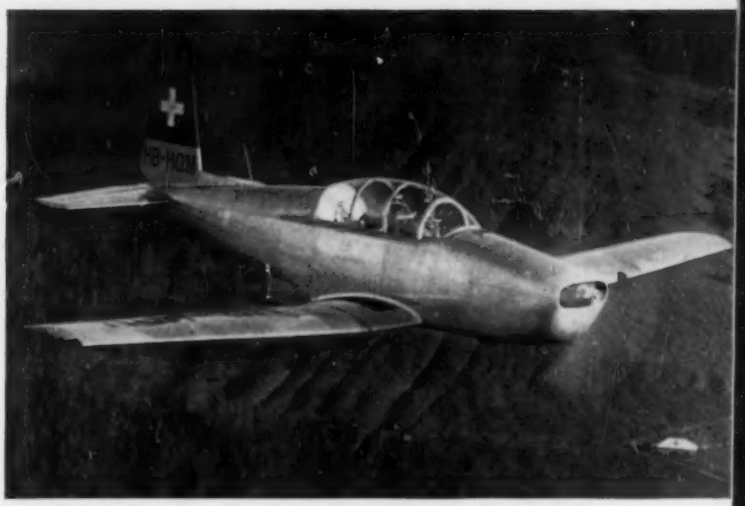
SWISS TRAINER

Details of the Lycoming-powered Pilatus P-3

MODERN ideas on flying-training techniques are, to say the least, fluid. Different countries—and different Services in the same country—favour various methods and sequences, but quite frequently change them. For the training-aircraft manufacturer, it is obviously useful to have a versatile machine capable of fitting into a number of training plans, yet with no loss in performance. Which brings us to the purposeful-looking aircraft shown on this page, the prototype P-3 trainer built by the Pilatus aircraft company of Stans, Switzerland.

In designing this aircraft, the firm set out, on the one hand, to meet the requirements essential in an elementary trainer (good take-off and landing performance, good flying qualities, and robust structure) and, on the other hand, to allow for the fact that pilots trained on this aircraft must be able to pass without further intermediate stages on to jet aircraft. The first flight of the P-3 was made last September: since then it has been granted certification by the Swiss Federal Air Office and has completed military tests.

The structure is all-metal, and its strength specifications comply with British standards for the aerobatic category up to its maximum gross weight of 3,310 lb. The forward section of the fuselage is semi-monocoque, and the rear is monocoque. The sliding full-view hood covering the tandem cockpit is jettisonable. Electrically operated flaps are fitted to the wings, which are of single-spar construction.



Particularly in Europe is it rare to find aircraft of this nature with stressed-skin metal construction employed throughout. The P-3 is rather bulkier and heavier than comparable American machines.

Points of note here are the massive single-piece rearward-sliding canopy, and the unusual wing section, with turned-down trailing edge and considerable wash-out. The British adoption of side-by-side seating—the result of many years' consideration—has not been followed in this instance.

PILATUS P-3

Dimensions

Span	34ft 1¼in
Length	28ft 8¼in
Height	10ft
Gross wing area	177.6 sq ft
Aspect ratio	6.55
Empty weight	2,280 lb
Useful load	1,030 lb
Max. gross weight	3,310 lb
Wing loading	18.6 lb/sq ft
Power loading	13.9 lb/h.p.

Performance (I.C.A.N. conditions)

Max. level speed (up to 6,560ft)	190 m.p.h.
Cruising speed (up to 6,560ft)	156 m.p.h.
Rate of climb (sea level)	1,440 ft/min
,, ,, (6,560ft)	726 ft/min
Service ceiling	18,050ft
Take-off to 50ft (concrete runway)	374 yd
,, ,, (grass)	431 yd
Landing run from 50ft (concrete runway)	426 yd
,, ,, ,, (grass)	404 yd

The tricycle undercarriage is electrically retractable in eight seconds, and is lowered in seven. An emergency manual lowering mechanism is provided. Hydraulic disc brakes are operated by foot pedals.

The power plant is a six-cylinder, horizontally opposed, air-cooled Lycoming GO-435-C2 developing 260 h.p. for take-off (3,400 r.p.m. at sea level) and fitted with an electric starter. Two plastic fuel-tanks with a total capacity of 35.2 Imperial gallons are fitted in the front portion of the wing centre-section.

Extra equipment which can be fitted for specialized rôles includes a pair of rocket-launchers for 5-cm Oerlikon training rockets, a bomb-rack for two 26.5-lb training bombs, and a camera-gun.

TECHNICAL PRIZEGIVING

PRIZES and diplomas were presented to successful students of the College of Aeronautical and Automobile Engineering in Sydney Street, London, on June 17th. Lord Brabazon of Tara, as president of the College, distributed the Lord Baden-Powell Memorial Prize to W. B. H. Blydenstein, the Silver Medal of the City and Guilds of London Institute to J. I. Morris, and the Edward Garnon Memorial Prize to M. S. Sopher and M. N. Shaikh.

This year for the first time the College population has passed the 400 mark, 32 different countries being represented—and the academic standard attained is remarkably high, as the great number of diplomas presented showed. Lord Brabazon, speaking after the presentation, made some very forthright comments on motor-car design, in which he maintained there still existed a vast field for basic design development. Turning to the aeronautical field, he said that Sir John Alcock, after his historic Atlantic crossing, was the first man to be able to say "When I was in America yesterday . . ;" by contrast, the existence of aircraft capable of making the east-west crossing in five hours, now made it possible for a pilot to say "I shall be in America yesterday." In the helicopter field Lord Brabazon referred to his first experience of helicopter flight, gained a few days previously, and said that it had been a good deal more agreeable than he had expected.

The theme of his remarks throughout, however, was that the scope for basic research was still far wider than many might suppose, and that the most important discoveries of the century, in electronics, motorcar design and aeronautics, had been the result of almost fortuitous basic technological research.

MODELLERS' DAY

The Northern Heights Model Gala at Hawkers' Langley Airfield

THE sunny skies over Langley airfield, near Slough, teemed with model aircraft of every conceivable shape and size on June 20th, when the Northern Heights model aircraft gala was held there by kind permission of Hawker Aircraft, Ltd. The weather held good throughout the day and a very large number of aeromodellers from many parts of the country took full advantage of it to fly their models, both in competitions and merely for the sake of doing so. The air was, in fact, continually saturated with models of every kind, and the unwary were liable to be assailed from any direction at any moment.

Perhaps the most noteworthy feature was the wide variety of models to be seen everywhere. The largest were the non-scale radio-controlled types, followed closely by the graceful high-performance gliders. The most remarkable were the larger scale models of World War II four- or twin-engined bombers, and the ducted fan (diesel driven) LA-17 and F-86.

While watching with rapt attention the furious wasp-like progress of a control-line team race, one might be "buzzed" by a radio-controlled model looking for a landing place, or, less ceremoniously, be struck smartly from behind by one of its unguided, but no less lethal, brethren.

Lady Boyle presenting the Queen Elizabeth Cup to C. J. Marsh of the St. Albans Club. On the right is the Northern Heights chairman, R. Copland, a one-time holder of this cup.

Sir Alliott Verdon Roe and Lady Roe were both present at Langley. Here Sir Alliott is seen examining H. J. Brigg's Avro Lincoln which won the "Flight" plaque in the Concours D'Elegance.

In contrast with many a full-scale aeronautical event, most of the spectators seen at Langley were knowledgeable enthusiasts. As the stertorous and hesitant first notes of an engine gave way to the smooth and angry hum of steady power, the group would spread out and the model emerge in full flight from their midst. Sometimes it crashed and shed detachable portions of structure in apparent catastrophe, but more often it flew strongly and remained airborne for a considerable time. The latter part of the day was partly devoted to the ritual of control-line team racing, in which a number of controllers paced round in a tight group, each skilfully controlling his model as it raced at over 60 m.p.h. to overtake its rivals.

Most of the activity of the day was directed towards competition for nine trophies and cups awarded in various classes and categories of model flying. The principal of these, the Queen Elizabeth Cup for F.A.I. international powered models, originally presented by H.M. Queen Elizabeth the Queen Mother, was won by C. J. Marsh of the St. Albans club with a total flight time of 687 secs. V. Jeyes (S.M.A.E.) and P. Buskell (Surbiton) were runners-up. The cup was presented on this occasion by Lady Boyle, wife of Air Marshal Sir Dermot Boyle, A.O.C.-in-C., Fighter Command. The *Flight* Cup for gliders was won by J. D. Waldren (Henley) with an aggregate of 600 sec. These results are much better than the corresponding figures for 1953, and reflect the high standard of the meeting. The Gala championship for the best performance in all contests went to D. Postner of Middlesex.

LUNCH FOR LAMPS

THE chairman, Sir John Makins, and the board of British Aviation Insurance Co., Ltd., entertained guests to lunch at Londonderry House on June 18th. Mr. J. A. Miller, deputy chairman, proposed the guests. He congratulated by name Prof. A. A. Hall and Sir John Boothman on their award in the Birthday Honours (Prof. Hall receives a knighthood and Sir John is made a Knight Commander of the Order of the Bath). He also spoke appreciatively about "our underwriter" (Capt. A. G. Lamplugh).

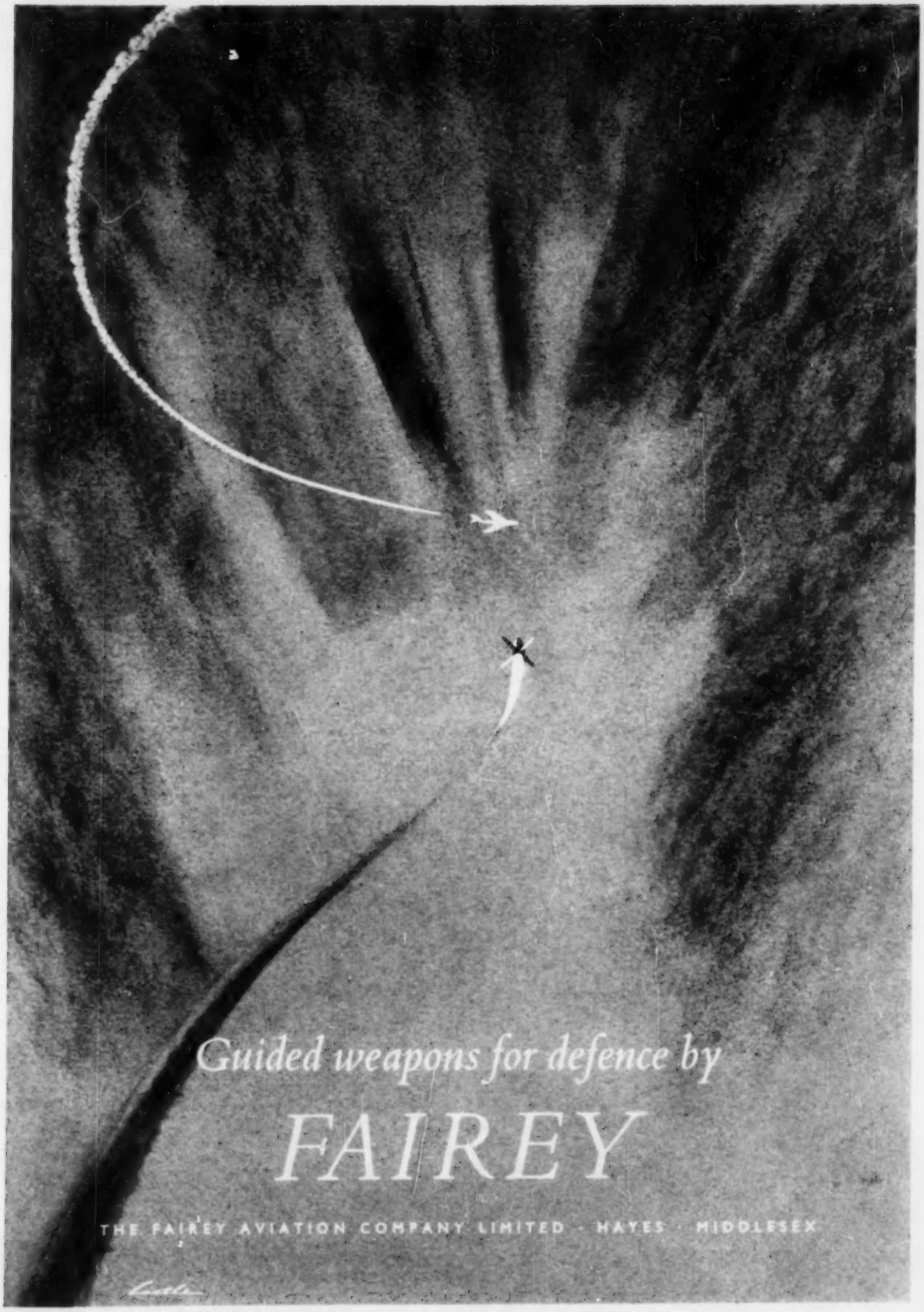
Replying, Mr. Peter Masefield touched on many subjects among them the matter of helicopters which ran "a serious risk of being oversold." He said, "We shall be fiddling for some time while clutches burn." It would be at least five years before there were really important commercial helicopter operations. He paid a tribute to Captain Lamplugh, saying that he was one of the greatest characters in aviation and mentioned that it was originally his idea that all church bells should ring to welcome the Queen on her return. This was typical of his imaginative mind. He said the guests would never want new lamps for old.

Capt. Lamplugh was prevailed upon to speak and said that the insurance community were his masters and the aviation community his friends, and he worked between the two, but when they met, as on this occasion, the stark truth came to light. He thanked the previous speakers for their kind remarks.

THE keen interest which continues to be shown in *Flight's* various historical articles and the interest aroused by events such as the display of veteran aircraft at Coventry, prompts us to remind readers of *Fellowship of the Air*. This large book was published to mark the Jubilee of the Royal Aero Club in 1951 and it contains fascinating accounts of the aircraft, people, and events which have gone to make up the traditions of British sporting, record-breaking and competitive flying.

The book is well illustrated and it contains the personal recollections and previously unpublished background of historical occasions from people who took part or were present and whose names are household words in many branches of aviation today. Of the later great occasions, the winning outright of the Schneider Trophy in 1931, for example, and of the golden years of long-distance light-aircraft flights to Australia, Africa and South America, there are accounts of outstanding interest.

Fellowship of the Air, by B. J. Hurren, is published for *Flight* by Iliffe and Sons, Ltd., price 30s.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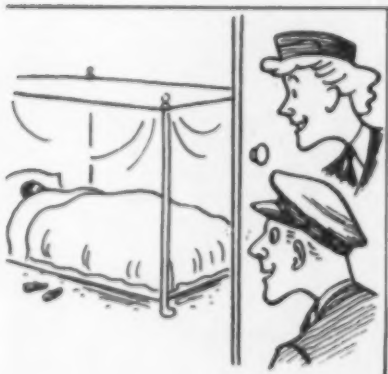

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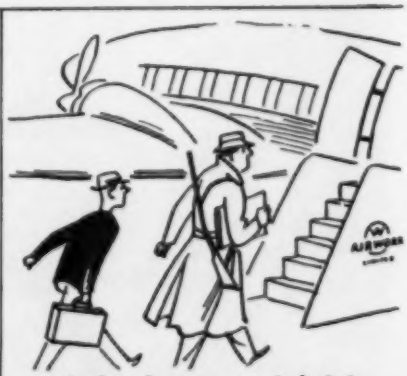

and for hunters and holiday makers the fares are just as reasonable

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The pilots of this quartet of N.F.14s are those listed on the following page.

ALL-WEATHER DEFENDERS

The Latest Meteor in Service with the Royal Air Force

IT was rather more than two years ago that we visited two of the first night-fighter squadrons of Fighter Command to convert from Mosquito N.F.36s and 38s to jet aircraft. One of these units had then just re-equipped with de Havilland Vampire N.F.10s; the other—85 Squadron—had received Meteor N.F.11s.

Since that visit, the N.F.11 has served No. 85 very well; these Derwent-powered grey-and-green two - seaters, resplendent in red and black squadron dicing, have ranged far and wide, and they flew past Her Majesty at Odiham on that memorable Royal Review one year ago. But no aircraft is so good that it cannot be bettered, and 85 shortly found themselves re-equipping with the considerably revised Meteor N.F.12. Now, not only has the last N.F.11 long since departed, but the squadron is progressively trading its 12s for a still better Meteor—the shapely N.F.14, depicted on these pages. Before discussing their new equipment, some notes on the unit itself will not be out of place.

The squadron was formed during the 1914-18 war, and saw much action on the Western Front. In fact, one of the most famous of all photographs of squadrons "in the line" is an air-to-ground shot of a line-up of S.E.5As of 85 Squadron, and a close-up of an 85-squadron machine appeared at the head of Mr. J. M. Bruce's history of the S.E.5, in our issue of July 17th last year. A point of particular interest is that the squadron's World War I insignia, a white hexagon painted on the fuselage, is still found, in modified form, on the tail fins of their present aircraft. This may be a unique feature.

During the 1939-45 war, No. 85 more than pulled their weight. Beginning the conflict with Hurricanes, they later received Defiants—which they operated with conspicuous success—and thus teamed up in two-man crews for the first time. From then on, it was a long struggle by night and day, on offensive patrols and intruding over enemy territory; the aircraft that bore the white hexagon were, in succession, Douglas Havocs and de Havilland Mosquitoes.

The unit worked through several marks of Mosquito, both in war and peace, before converting to their first jets, as already recorded. At the time of the conversion, the C.O. was S/L. J. D. Hawkins, A.F.C.; the present commander is S/L. B. J. Scandrett, A.F.C. Attention may now be turned to the squadron's aircraft.

Fourteen is a respectable mark number for any aircraft, and it is worth noting that the last eleven marks of Meteor have been developed in peace-time. By about 1948, the Meteor position was as follows: the standard fighters were the Mk 4 and the new Mk 8; the longer T.7 trainer was just entering full service, and

P/O. C. L. Fitch (left) with his navigator, F/O. M. Vaughan. The Meteor 14's landing lights are mounted on the nose-wheel door.

ALL-WEATHER DEFENDERS . . .

Gloster's were about to start production on the camera-equipped F.R.9 and P.R.10. The company was also hard-pressed with development work on the great G.A.5 all-weather fighter, now known as the Javelin.

Accordingly, it was decided to farm out all work entailed by the development of a Meteor night-fighter to another member of the Hawker Siddeley Group. Sir W. G. Armstrong Whitworth Aircraft, Ltd., of Coventry. This company, who now also make Hunters, Sea Hawks and much else besides, took very few months to turn out the first N.F.11. The first prototype, WA 546, was flown by S/L. E. G. Franklin, D.F.C., A.F.C., the company's chief test pilot, on May 31st, 1950. It was a completely new aircraft, although many of its major parts were similar to, or even interchangeable with, those of some other Meteors. The wing was very similar to that of the P.R.10 or the old F.3, with a span of 43ft and rounded tips, but the outer panels housed four electrically fired 20 mm guns, disp'aced from the nose by the added interception radar. The fuselage resembled that of the T.7 trainer, with the pilot and navigator in tandem, both facing forward, under a massive canopy hinged to starboard. The tail was that of the F.8 day fighter.

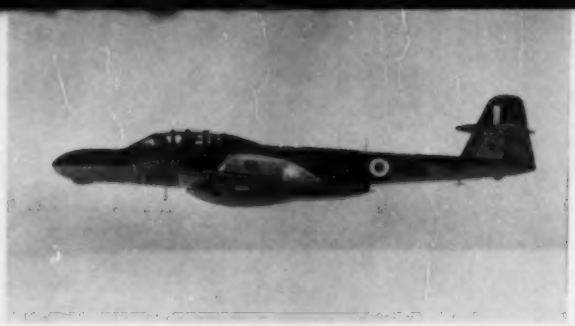
The prototype N.F.11 at one time appeared with wing-tip tanks, but these never became standard; the considerable internal fuel capacity is invariably supplemented by both ventral and underwing tanks, as on the single-seat Meteors. The production 11s became, in the words of the Hawker Siddeley Group, "the backbone of night fighter defence of the country." The type was also supplied to NATO, for service in France, Belgium and Denmark.

On December 21st, 1952, F/L. J. O. Lancaster, D.F.C., took another new night-fighter mark into the air; this was the N.F.13, a machine externally almost identical with the N.F.11, but specially equipped for work which could not be performed by the earlier machine. It is not operated by Home-based fighter squadrons.

The next development was the far-more-effective Meteor N.F.12, which first flew in the hands of S/L. Franklin, on April 21st, 1953. Details of the improvements made are not publishable, but the nose is longer, better streamlined, and of greater internal capacity, and it may be assumed that more power-

On the far left, four of 85 Squadron's aircraft are being flown by S/L. C. J. Homes, A.F.C., F/O. G. A. Embleton, F/O. P. J. Bogue and F/L. D. O. Evans.

Left, the same four aircraft are seen in partial silhouette, and the lines of the 14 are seen to be at least as good as those of any other Meteor.



Upper right, a photograph of a Meteor N.F.11 taken when "Flight" visited the squadron in 1952. Compared with the Mk 14, differences may be discerned in the shape of the nose, canopy and fin.

ful combat radar is installed. Another superficial modification in the 12 is the fairing-in of the tail "acorn" to improve airflow and help to balance the added side-area of the nose. The overall length is increased to no less than 49ft 11in.

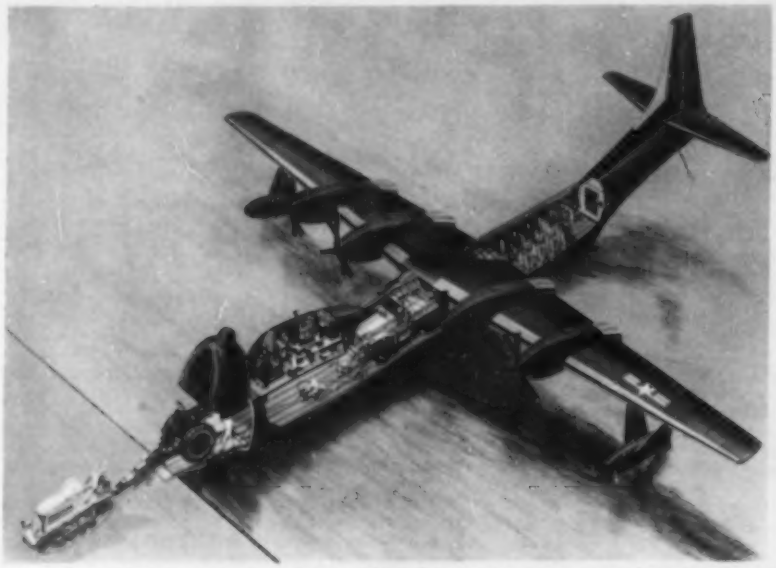
The latest Meteor, the N.F.14, first flew on October 23rd last, the pilot being F/L. W. H. Else. Basically an improved Mk 12, it discards the old "Forth Bridge" canopy, and has a two-piece blown hood which, when assembled, has all the characteristics of a frameless canopy. It is associated with a sharply raked windscreen, of revised form. This hood is immensely popular with 85-Squadron crews, and—even when one is encumbered by full military gear—it is possible to look at one's own tail.

It is not yet permissible to discuss any of the equipment of this fine machine, but it can be said that the long dorsal protuberance, which breaks the top-line aft of the hood, is a guide rail for the canopy. From the aspect of performance, it might be thought that the evidently considerable weight of the machine must make it rather sluggish; but, compared with its predecessors, it is clearly exceptionally Mach-worthy, and is officially described as "the fastest version of the Meteor yet produced."

Finally, S/L. Homes, mentioned in the captions, did not command the squadron; he was promoted to his present rank only when he left No. 85 to take up a staff post.

Above, pilots and navigators of 85 Squadron get into a pre-flight huddle. At the end of the line is a day-fighter Meteor F.8. On the right, S/L. C. J. Homes, A.F.C., with his navigator, F/L. J. Bransgrove, watch the altimeter unwind over cloud-dappled southern England.

AIRCRAFT INTELLIGENCE



TRADEWIND: This drawing of the Convair R3Y-2 Tradewind transport, one of the first photographs of which, showing the bow-loading arrangements, appeared in "Flight" last week, is a complete exposition of the loading and stowage arrangements on this magnificent machine. Possible loads are four 155 mm howitzers (one of these is shown being loaded), three 2½-ton trucks or six jeeps. In the after fuselage a few of the possible 103 rearward-facing passenger seats can be installed. As an ambulance the Tradewind carries 92 stretcher cases. Gross weight is 80 tons and take-off time (using the full 22,000-odd h.p. of the Allison T-40s) 30 sec

United States

North American Designations. The type designation F-107 has been tentatively assigned to the North American F-100B, an all-weather version of the F-100 Super Sabre. *Aviation Week* reports that the F-100C will be the fighter/bomber version, carrying a heavy load of external armament and fuel. "Guppy" is the name of a North American lightweight fighter reported to be in the same general category as the Northrop Fang.

Republic F-105. In general appearance this fighter/bomber will be similar to the F-84F Thunderstreak, but the wing will be more sharply swept back and the overall dimensions larger. The Allison J71 turbojet will be fed through wing-root air intakes, and there will be an interchangeable nose, housing photographic equipment or armament for tactical operations.

Convair Sea Dart. A new version of the Sea Dart (F2Y) delta-wing, water-based fighter will have a single hydroski, whereas earlier prototypes had double skis. Both configurations will be evaluated to determine the most suitable for production. It is expected that production machines will be powered by a single Wright J67 or a Pratt and Whitney 75.

Lockheed XC-130. The first prototype of this very promising turboprop-powered (Allison T56) military transport, details of which were given in our special Military Aircraft Number last week, should leave Lockheed's Marietta factory later this month.

France

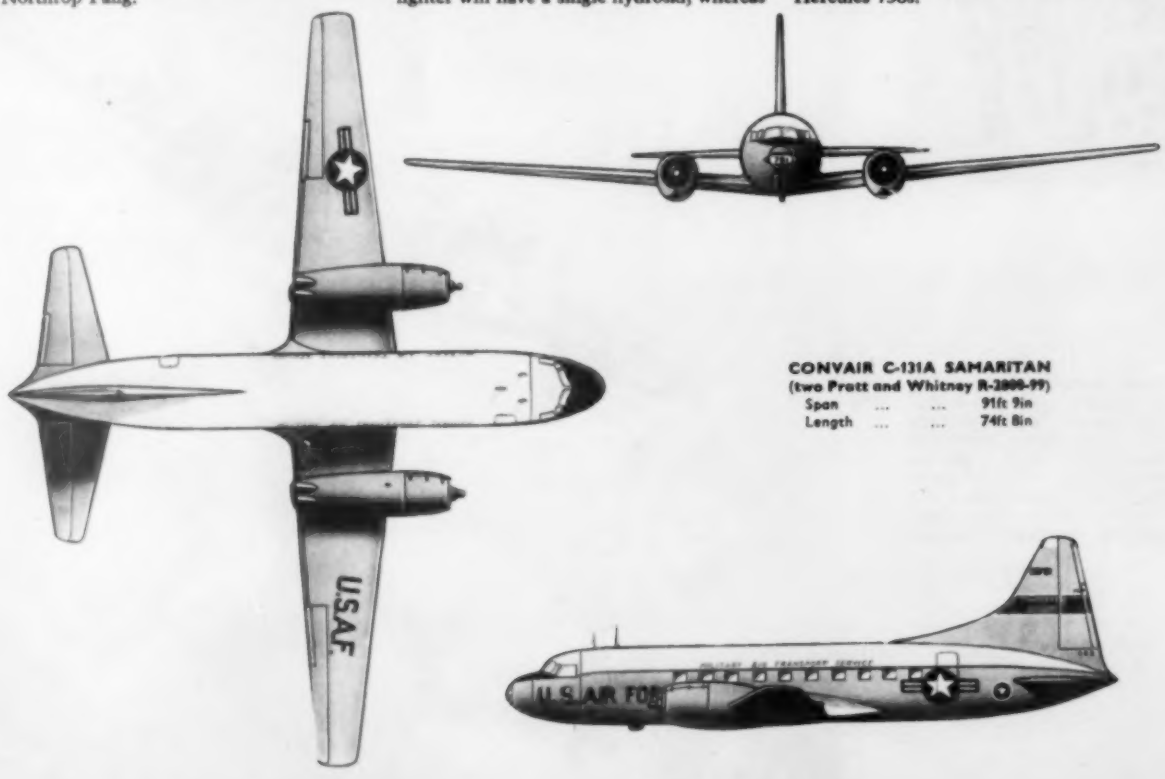
Morane Saulnier 755 Fleuret. This side-by-side twin-jet light trainer, which has been on test in India, completed 77 flying hours between May 9th and June 7th Two student pilots of the Indian Air Force with only 50 hr of Prentice-time behind them, are said to have soloed after 7 hr and 7 hr 40 min respectively in the Fleuret.

S.E.5000 Baroudeur. The second prototype of this trolley-launched attack fighter has made seven flights and the first has completed 76 flights, totalling more than 40 hr. A "pre-series" of three machines, in addition to these two prototypes, has been ordered by the French Government.

S.O.4050 Vautour. At a reception given recently by S.N.C.A.S.O. in honour of persons who have flown faster than the speed of sound in the Vautour, M. Georges Glasser stated that the first prototype had exceeded Mach 1 more than forty times in the course of many and varied tests, totalling nearly 200 flights. More than 28 people have experienced the *franchissement du mur du son* in this aircraft, including M. Christiaens, France's Air Minister.

Spain

C.A.S.A. Projects. Projected by Construcciones Aeronauticas, S.A., are the Types 207 Azor and 208. The 207 is a low-wing transport along Convair 240 lines, powered with Bristol Hercules 730s, and the 208 is a Packet-like machine, with Hercules 738s.

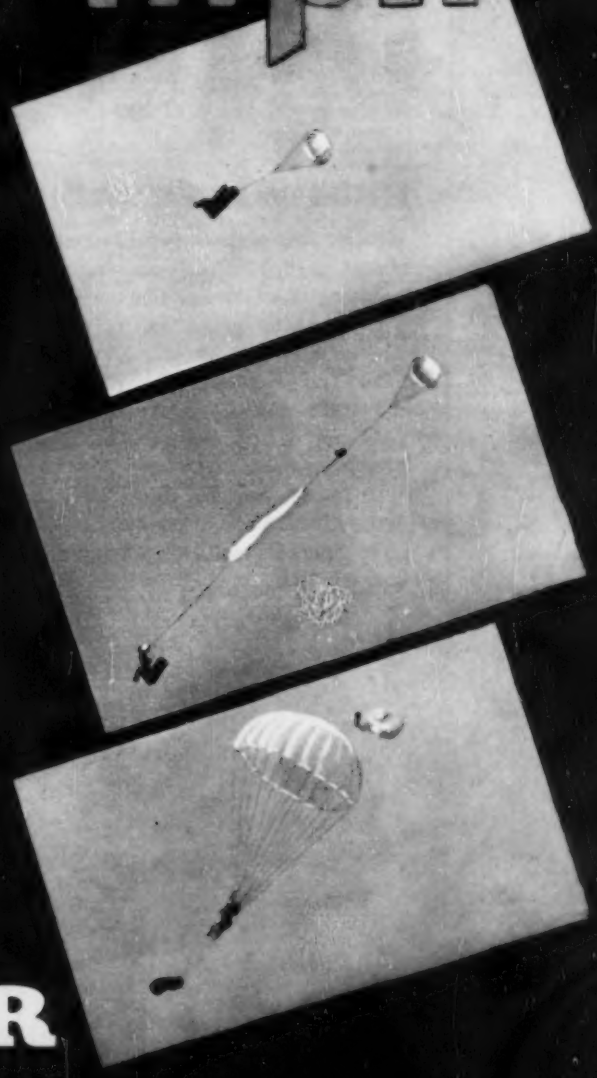


CONVAIR C-131A SAMARITAN
(two Pratt and Whitney R-2800-99)

Span	...	...	91ft 9in
Length	...	...	74ft 8in

at low altitudes each second is vital

150 ft. 600 mph



On the 17th March, 1954, an ejection in straight level flight was made from a Meteor 7 aircraft with the Martin-Baker Patent fully Automatic Ejection Seat.

- The speed 600 m.p.h., the height only 150 feet.
- One second after ejection, drogue developed holding seat steady and slowing it down.
- Three seconds after ejection, parachute fully developed with 80 feet in hand.

Patented in the principal countries of the world and certain patents pending

MARTIN-BAKER

AIRCRAFT COMPANY LIMITED HIGHER DENHAM NEAR [illegible]

The flying-boat

NATURAL MEDIUM FOR ATOMIC PROPULSION

IN THE DEVELOPMENT *of jet engines and jet-propelled aircraft Britain has led the world. Shall we be ready to take the lead again when atomic propulsion is as real as the jet?*
That atomic power will be harnessed as a means of propulsion is now certain: many applications are already under development. It is merely a matter of time—less time probably than we think. There is another certainty too—that an atomic power plant, with its protective shield, will be far heavier than any previous system of aircraft propulsion. It is estimated that, for years to come, the minimum all-up weight of an aircraft designed for atomic propulsion will be in the region of 500,000 lb.—probably even higher.

HIGH WING-LOADING

With atomic propulsion will come the advantage of almost negligible 'fuel' consumption and the corresponding disadvantage that landing weight must be a much higher proportion of take-off weight. High wing-loading at both take-off and landing is inevitable. The long landing run involved, coupled with the great size of the aircraft, puts the landplane right out of the picture. *The atomic aircraft must be a flying-boat.*
Fortunately for the future, our behind-the-scenes aerodynamic and hydrodynamic research has equipped us to design high-efficiency flying-boats of the size and characteristics required. In fact, 60% of the estimated minimum size necessary for atomic propulsion has already been achieved in the Saunders-Roe *Princess*.

PROFITABLE PRINCESS

But this fine aircraft is something more than the pattern for the large atomic flying-boats of the future. The *Princess*, outstanding in both performance and payload, can be applied to long-haul services on a new basis of economy. With its operational engines this stately flying-boat makes a highly attractive commercial proposition.
Consider what a modern flying-boat such as the *Princess* has to offer the civil (or military) operator. It is independent of the land runway—now so vulnerable and prohibitive in cost. It is the landplane's equal in speed. Its range enables it to offer minimum block times over the longest routes. On long trans-ocean stages, a flying-boat gives the air traveller greater confidence—a feeling of security that is important when 75% of the world's surface is water. And an up-to-date water-based aircraft can operate—as the *Princess* has demonstrated—from natural stretches of water such as the Solent. Its base facilities are not costly. It can make full use of every modern navigational aid that is available to the landplane.
The modern flying-boat is a paying proposition—as well as a pattern for the future.

Pattern for the atomic age—the Saunders-Roe Princess, forerunner of 500,000 lb. atomic-powered flying-boats.

An announcement by **SAUNDERS-ROE**

A Ride, a Spell at the Controls and the Order Outlook

A characteristic shot of the H.D.31 during its demonstration flight at Coventry on the occasion of the recent National Air Races.

"Flight" photograph

AIRBORNE in the HUREL

RECENTLY the Hurel Dubois H.D.31 visited London Airport on its way to Coventry and an opportunity was afforded the Editor to fly in it and to take a turn at the controls. A few remarks on the handling and flying characteristics, together with the latest news of possible orders make a fitting postscript to the full description in our issue of June 18th.

This visiting H.D.31 prototype is unfurnished and without fittings except for some pairs of temporary seats, some instrumentation and, on this flight, a few spares such as a main wheel stowed aboard.

The party, having taken its seats, was provided with cotton wool and the engines thundered into motion. The aircraft had only recently landed so no full run-up was required. It was clear that ground manoeuvring is a simple enough procedure and, although the span looks terrific both from outside and from within, it is very little greater from the pilot's point of view than, say, a Stratocruiser—and may thus be considered as a large aircraft with a small fuselage, rather than a small aircraft with long wings.

Preparations for take off included the lowering of the flaps like one slat of a vast venetian blind. Then with a deafening roar the machine surged forward and within, it seemed, a few fuselage lengths the nose rocked up and we were airborne and rising rather than climbing forward. About 400ft up (with plenty of the runway still left below) the pilot wheeled the H.D. off to port and we climbed on towards the South. Even allowing for the lack of furnishing—we were in fact in a light-alloy box—the noise was rather shattering and the vibration considerable. It will need some skilful soundproofing and extensive use of thick carpets to damp down all the "to-do" and make passengers in the production H.D.32s (with bigger engines) comfortable.

A different collector to give outward facing exhausts would probably be worth the trouble involved in fitting it, in view of the position of the power units (ahead of sound boxes formed by the slab fuselage sides, the mainplane lower surfaces, the main struts and the stub-wing top).

The cockpit is much quieter and, though compact, gives plenty of space for the crew and the equipment likely to be required in this kind of machine. The pilots have an excellent view and the controls are all handy. I do not personally like push-pull throttle and airscrew pitch levers but those fitted work well enough. The rudder trimmer is correctly geared and two or three turns takes over the rudder load if an engine is feathered. The elevator wheel was less good and apart from being stiff did not seem to have the same positive effect.

I was not able to do very much with the aircraft during my ten minutes in the right seat but I did try general and single-engined flying and a stall—if that is what it should be called.

In this H.D.31 (2 × 800 h.p. Wrights) with 2,200 r.p.m. setting and a French boost figure that meant nothing to me we winged along at 120 m.p.h. at 1,500ft. The ailerons feel Ambassadorish, that is to say, of medium weight and effectiveness. As I discovered later the ailerons retain some control right down to the stall which comes in the form of a gentle sink at a ludicrously low speed of about 50 m.p.h. I.A.S.

The turning circle of the H.D. can be very tight indeed, especially if a little flap is down as on an approach, but to make a correct right turn quite hard application of the rudder is required. Hands-off flying showed that this was not a matter of trim, for the needle and ball were spot-on. Mr. Hurel told me afterwards that it was probably a slipstream effect and would be corrected at the tail on later machines.

It seemed to me also that rather more powerful elevators would be an advantage but, as I did not make an approach or landing, I was not able to form a complete opinion.

This prototype carries the experimental leg-mounted air brakes and it has small cusped spoilers on the upper surface near the wing tips to increase aileron effect. In flight, the wing is rigid out to the main strut attachment point but flexes gently outboard to the up-swept tip.

Back in the cabin I experienced the very slow steep approach back to the No. 28L London runway, and felt the gentle main-wheel-first touch down at Tiger Moth speed. No attempt had been made to do either a minimum speed landing or a short run.

Large Orders

The latest order book possibilities as outlined by the maker's representative came as a surprise to me. In addition to the 24 for Air France and eight probables for other companies, it is understood that the French Navy has now more or less decided to have 40 for transport duties and the French Government may take 100 for coastal and anti-submarine duties. Whether the 100 have NATO or off-shore connections we were not told. In addition to these orders the French Government are also likely to underwrite another 50 aircraft to help the export chances. An additional likely application is for Sabena's Congo services, and the Hurel Dubois company have naturally not overlooked this opportunity.

With these numbers in mind production plans are in hand for 300 aircraft, to be delivered over the next six years. Negotiations are in hand for building under licence outside France should orders make this desirable.

Variants which have been named are the H.D.31 prototype, H.D.32 for production as a transport—civil or military, the H.D.35 basically similar but equipped for anti-submarine duties and the H.D.36 flying classroom for radar/navigation training. A cargo variant of the H.D.32 might have the new Wright R-1820 H Series engines.

Three of a type, these Hurel Dubois in formation are the H.D.10 leading; the H.D.31, the subject of these notes (in number two position) and the more powerful H.D.32 nearest the camera.

WILLIAM DRING, A.R.A. *A Training Jump at Ringway, 1945.* Imperial War Museum.

KEITH SHACKLETON. *The Sea and the Helicopter.*

AVIATION AND ART

Some Thoughts on the Formation of a New Society

By TERENCE MULLALY

LAST week we made brief reference to the inaugural exhibition of the Society of Aviation Artists, and below we publish an article, by T. F. S. Mullaly, M.A.Cantab., on the background to the new venture. We follow it with some personal impressions of a visit to the exhibition, written by two "Flight" artists whose work—notably in cut-away drawings of aircraft and engines—regularly appears in our pages. The show—at Guildhall Art Gallery, in the City of London—ends tomorrow, July 3rd.

THE recent formation of the Society of Aviation Artists is a move of great importance not only to those who are in any way connected with developments in the air, but also to all who have the welfare of the arts in this country at heart. For in this age of rapid advances in air transport it is clear that a great new field of endeavour has already opened up for the artist, and that quite apart from artistic considerations he can do much to make the public more air-conscious. Yet so far this field has hardly been touched.

The traditions of imagination and precision established by the British aircraft industry, are of course, second to none, and the work of the technical draughtsman has in a large measure contributed towards the establishment of these traditions, which have done much towards the creation and maintenance of Britain's reputation in the air. Nevertheless, few professional artists have turned to aircraft for their subject-matter; and for reasons that are perhaps not immediately obvious the efforts of the few pioneers in this direction have frequently been disappointing. It is precisely to overcome these difficulties, to encourage interest in paintings of aircraft and the aircraft industry, to record great events and to discover hidden talent, that the Society of Aviation Artists has been founded.

The painter who devotes his energies to painting aircraft is faced with certain special problems that are quite unknown to the average artist. So long as he is content to paint scenes illustrating the work of the aircraft industry, or aircraft on the ground, he is not faced with unusual difficulties; but as soon as he turns to painting aircraft in flight he is confronted with a whole series of special problems. These stem in the main from the fact that opportunities to make drawings and sketches in the air are few and far between. In consequence, the artist is compelled to work from studies made on the ground or, alternatively, to make use of photographs. Both methods involve serious drawbacks.

Even if the artist succeeds in largely overcoming these difficulties where the actual painting of the aircraft themselves is concerned, he finds himself faced with even more complex problems when it comes to relating the aircraft to their background. This became clear during the last war, when many of the effective (and, so far as the details of aircraft were concerned) accurate aeronautical paintings produced by various war artists proved unsatisfying, largely due to the fact that the aeroplanes in question appeared divorced from their context. One became used to aircraft being depicted taking-off against an indistinct background, or in flight amid unsatisfactory cotton-wool clouds and with the ground looking like a rather amateurish stage set.

On the other hand, there were, of course, a number of highly successful war-time paintings of aircraft; one remembers in particular several views of Sunderlands flying over a convoy and a series of excellent studies of individual aircraft on the ground. But by and large there were more failures than successes. Yet, the already quite considerable number of admirable paintings of aircraft that have in fact so far been produced make it quite clear that greater experience, more facilities for the artist to study aircraft and an increased demand for this type of picture are all that is needed to open up a great new field. Indeed, it is apparent that no more auspicious moment could have been chosen for the formation of the Society of Aviation Artists.

The Society will not only concern itself with paintings of aircraft, for it will include in its exhibitions pictures illustrating all aspects of the work of the aircraft industry and views of aerodromes and marine-aircraft bases. At the same time, studies of historical events connected with the air—R.A.F. parades and so on—and portraits of those who have played a part in aeronautical developments will also be acceptable.

Among the distinguished group of artists and others who have been largely responsible for the formation of the new Society are such outstanding figures connected with the air as Leonard Bridgman, the editor of *Jane's*, and leading painters like Norman Wilkinson, Hesketh Hubbard, Terence Cuneo and Charles Cundall, R.*A*. In addition, others (like G. H. Davis and Roy Nockolds) who not only have first-hand experience of flying but who have also established reputations as being among the most successful painters of aircraft, have helped to found the Society.

It is appropriate to say a word about Davis and Nockolds, for these two artists have already indicated one of the main lines that the members must follow if the Society is to achieve the success it deserves. G. H. Davis, who was a pilot in the First World War, and who took part in the first night-bombing raids, has by his work for *The Illustrated London News* done as much as anyone to encourage a general interest in developments in the air. Roy Nockolds, who was an official war artist and has also made a reputation as a racing motorist, has concentrated on painting aircraft and has proved himself to be one of their most accurate and sensitive interpreters.

With such sponsors and with the great mass of hidden talent

KENNETH McDONOUGH
The Royal Flying Corps in the Field, 1914.

that it is safe to assume will be discovered once the Society is established (it has, in fact, already evoked a positive response from many quarters) it seems certain that the Society of Aviation Artists will rapidly become an important means of disseminating interest in the air, and will come to play an active part in the artistic life of this country.

A CRITICAL INSPECTION

THE Guildhall Exhibition is good, solid, serious material, there being nearly 150 exhibits, predominantly oils. The range of subjects is fairly wide within the specialized field, but while portraits of aeroplanes are to be found in profusion, human interest is somewhat lacking. The Imperial War Museum does something to redress the balance by loaning such canvasses as *N.C.O. Pilot, R.F.C.*, by Sir William Orpen, R.A., and *A Training Jump at Ringway, 1945*, by William Dring, A.R.A.

Contemporary industrial artists are, of course, well represented. Roy Nockolds makes a bold abstract attack on the subject *Supersonic*, one of a series for Armstrong Siddeley. He also has the distinction of offering the highest-priced conventional picture—a high-flying B-47 at 210 guineas.

Frank Wootton's magnificent *Rocket-firing Typhoons, Falaise Gap, Normandy, 1944*, is there, again by permission of the Imperial War Museum, while one of his not-so-frequent water-colours—of a B.O.A.C. Constellation refuelling—is found in its appropriate section. The relative lack of water-colours and almost complete absence of pencil and ink work is to be regretted, as the latter is so often a stepping-stone to other media and must do much to improve pure draughtmanship. This matter of uncertain draughtmanship occasionally offends, spoiling an otherwise sound picture.

Terence Cuneo can seldom be criticized adversely on this score, and he shows his courageous use of solid colour to great advantage in *Balloon Ascent from Crystal Palace*. His *First Flight*

SIR WILLIAM ORPEN, R.A. *The N.C.O. Pilot, Royal Flying Corps.*
Imperial War Museum.

DAVID SHEPHERD *Avro Lancaster, Q Queenie.*

FRANK WOOTTON *R.M.A. Beaufort Refuelling at Zurich.*

AVIATION AND ART . . .

Across the Pacific is a creditable attempt at that near-impossible subject, an electrical storm.

The old-timers are there, too. G. H. Davis takes us back to World War I with two large air-battle canvasses. It is as well to remember that this artist is still turning out commercial work at an astounding pace—nearly forty years later. Leonard Bridgman, whose fresh monotone wash work is seldom seen today, exhibits nostalgic pictures of Flycatchers, Seals and Pups, while age is truly honoured in the work of Sir Roderic Hill, whose early sketches were published in *Flight* early in the Kaiser's War.

C. E. TURNER *Destruction of the first German aircraft in World War II by a Blackburn Skua.*

For contrast, there are plenty of examples from up-and-coming artists like John Young and Frederick Draper, both of whom have been greatly encouraged by de Havillands. Industrial patronage is, in fact, quite strong and while some will regret this trend it must be admitted that an ever-increasing number of people are becoming art-conscious because of it.

Only four women artists are listed. Among their work Pamela Drew's free-and-easy pastel style is refreshingly different. From her bang-up-to-date study of 56 Squadron's Swifts we can turn to a typical representative of early aeronautical art—C. R. W. Nevinson, A.R.A.—with his *Swooping Down on a Hostile Plane.*

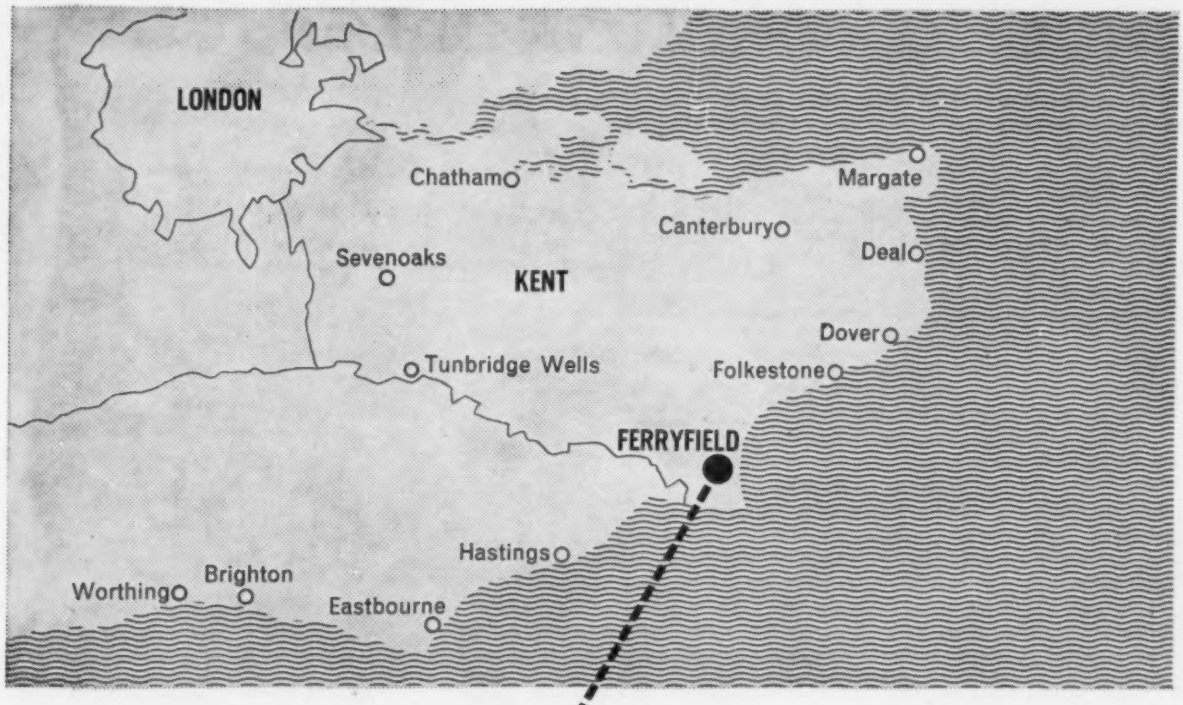
Three men well known for their love of marine subjects, Norman Wilkinson, P.R.I., Charles Rears, R.O.I., and C. E. Turner are all exhibiting; and while near watery scenes we must commend Keith Shackleton's *The Sea and the Helicopter.*

Walking round the exhibition one was carried by memory or imagination through all the romance of flight in war and peace: from Kitty Hawk to World War I and on to the devastating power of modern air warfare; from war back to peace and many paintings of commercial aviation; each aircraft with its own particular character and subtle beauty of line and form, and its appeal to the artist in play of light and reflection. Several canvasses, in particular, bring unfortunates now earthbound some of the ethereal qualities and glories of earth and sky seen and experienced only by those who fly. An example is David Shepherd's *Sunset at 40,000 feet.* The title of another painting by the same artist, *A Forgotten Friend—Lancaster Q for Queenie, late of the Dam-Busters,* brings to mind our own "forgotten friends."

And so we could go on. There is something in this exhibition for everyone, and we strongly recommend the interested reader to see it for himself (it closes tomorrow, Saturday, July 3rd); better still, he can become a lay-member of the Society for a guinea a year and so take part in consolidating these excellent beginnings (particulars can be obtained from The Secretary, Society of Aviation Artists, 23 Albemarle Street, London, W.1).

It will be interesting to see, should this exhibition become an annual event, if the quantity and quality of work can be maintained.

A. B. and F. M.



Fly your car from Ferryfield

The first stop (a short one) on a Continental motor-trip is Ferryfield, Silver City's new airport, built to meet the ever-growing demand for car lifts to the Continent.

From Ferryfield, near Lydd in Kent, Silver City Airways give cars and motor-cycles a flying start southward in the capacious fuselages of a fleet of specially-designed Bristol Super freighters.

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All Silver City's aircraft use Shell fuel and Shell lubricants ; Shell is proud of its association with this most forward-looking airline.

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SHELL

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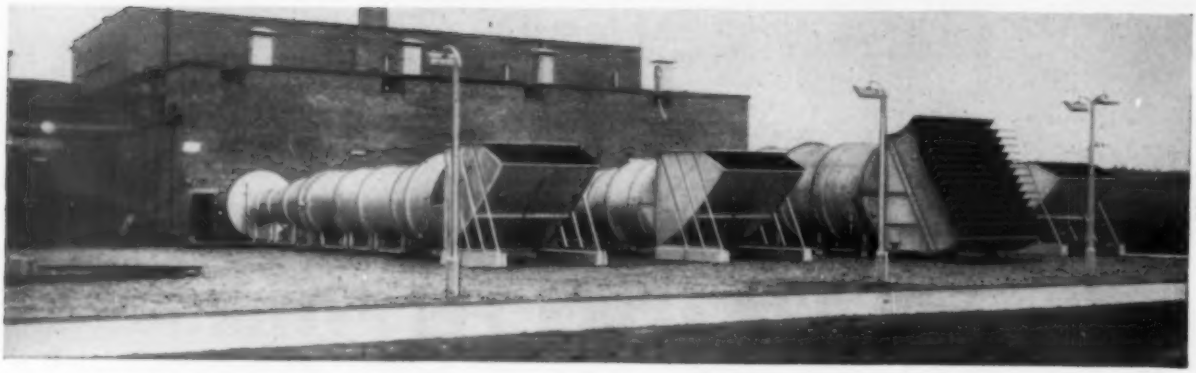
photographs by courtesy of Rolls-Royce Ltd.

TWENTY-FIVE years experience of successful acoustic engineering practise helped produce Cullum Detuners, which reduce the roar of jet engines—most shattering of all noises—to a mere whisper. This same experience, contributed by Horace W. Cullum & Co. Ltd. is available for the solution of all noise problems met with in industry and commerce. Consultation is invited.



Four of the eight Cullum Detuners installed at this new Rolls-Royce Glasgow Factory.

Air Intakes to Test Beds, showing Acoustic Splitters—designed and installed by Horace W. Cullum & Co. Ltd.

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CORRESPONDENCE

The Editor of "Flight" does not hold himself responsible for the views expressed by correspondents in these columns; the names and addresses of the writers, not necessarily for publication, must in all cases accompany letters.

Messenger Genesis

I WAS very pleased to read in *Flight* of June 11th that an award of £1,000 had been made to Lt.-Col. H. C. Bazeley for his idea of using light aeroplanes for A.O.P. purposes.

You may be interested to know that it was at his request that the Miles Messenger came into existence.

In the early summer of 1942, he approached Miles Aircraft, Ltd. with a view to their producing a special A.O.P. aircraft, as no existing aeroplane completely fulfilled the requirements for this job. He laid down an arduous specification and on September 12th, 1942, the prototype Messenger made its first flight piloted by its designer, Mr. G. H. Miles. Within a week it was submitted for trials by the A.O.P. Unit at Old Sarum and was acclaimed by them as being exactly what was wanted.

The Messenger subsequently went into production as a V.I.P. Communications aircraft, and the nearest the Army ever got to having one was the personal aircraft allotted to Field Marshal Montgomery.

It is nice to know that Lt.-Col. Bazeley has received this award, for to him goes the credit of initiating an aeroplane which, twelve years later, still has no equal in respect of performance, economy, payload and low speed handling characteristics.

Although it was never used for the purpose for which it was designed, many private owners today have cause to be grateful to Lt.-Col. Bazeley and to Mr. G. H. Miles.

Farnborough, Hants. D. L. BROWN.

Pro Dam-busters

I AM sure many more of us will be embarrassed by the letter from Mr. John C. Edmunds (*Flight* 18/6/54) than are likely to be by *The Dam Busters* film.

It must be admitted that some post-war flying films have made R.A.F. types go hot under the collar, but not for the reasons put forward by your correspondent. He deplores the loss of lives in the Ruhr caused by the dam-busting operation, but we applaud the efforts of the producers of this latest film to give an authentic record of an operation which was typical of Bomber Command's long battle against an enemy which did not show much regard for civilian lives in London, Warsaw, and Belsen.

Mr. Edmunds suggests that a more suitable film could be made of the Malta Gladiators. He could be reminded that quite a few civilians were killed on the George Cross island. But then, they were not Germans.

The Pathfinder Club, London, W.1. G. A. THORNE.

Note for Film Producers

COME, come, Gentlemen. W/C. Gibson's Lancaster with Rebecca aerials! (*Flight*, June 18th, p. 801).

Edgware, Middx. A. JENKINS.

Bad Publicity

IN the days of inter-planetary flight, the most memorable defect of the by then defunct British nation will be the eagerness it applied to cutting its own throat.

For example, the Sunday press was recently allowed to splash a story of a large prototype, which will help its protagonists little when they try to sell this fine aircraft overseas.

My contention is that incidents arising from the testing of prototype aircraft should be classed as "bedroom secrets" or else they will be added to the "knocking" campaigns of certain foreign competitors with rules of sportsmanship far below those suggested by the late Marquis of Queensbury.

Canterbury, Kent. HAROLD NICHOLSON.

Security-screening

WITH reference to the letter by "Briton in America" which you published in your issue of June 11th, I would, with your permission, take up and extend his query as to whether aliens suffer the same fate when seeking employment in the British aircraft industry.

To appraise this situation it is not necessary to dispute here the desirability or justification of security measures but simply to consider the manner of their application.

Thus, a person seeking employment, say, in a technical capacity with a firm engaged on secret work is, unknown to himself, subjected to the screening process. In the event of the applicant not having fulfilled the security requirements, he is merely informed by his firm concerned that no suitable employment can be offered to him. And this is all he is told. If he then continues to apply to other firms in the industry he will meet with the same treatment; and since practically the whole of the aircraft industry comes within the security set-up he will, after a bewildering and frustrating lapse of time sufficient to have enabled him to contact nearly every aircraft firm, find himself virtually blackballed and wondering whether he or everyone else is crazy.

What merits particular note is that the screening has been contrived to render it extremely difficult to establish even the fact that such measures have been applied in any particular case; to provide no explanation nor reasons for any decision made; to avoid the necessity of divulging the source or validity of the information used against the person concerned or the identity and reliability of informers; and to allow of no recourse on the part of the victim to the ordinary legal processes for the defence and protection of his rights, character and livelihood.

It is difficult to escape the conclusion that the reasons for the security measures adopted in this country are in some measure a form of political discrimination, and that the methods employed in their application cannot easily be justified either in that part of the British constitution traditionally dedicated to the protection of civil liberties and the rights of the individual by trial by jury, nor in the Charter of Human Rights compiled by the United Nations Organization.

Berkshire. BRITON IN THE U.K.

End of a Hannibal

WITH reference to the letter "Imperial Blow-up" in your issue of June 11th, I remember flying in late 1939 or early 1940 in an H.P. Hannibal from R.N.A.S. Donibristle.

This aircraft was eventually "dropped" from almost 20ft on landing with a party of local Black Watch who were doing aerodrome defence duty. The lower port mainplane was badly damaged and the oleo leg came up and hit the lower engine, knocking off the reduction gear.

The wing was replaced and another engine fitted, but I do not think the aircraft flew again; it certainly did not leave Donibristle, and was written off (on survey by, I think, a S/L. Heart) for excessive corrosion. There was some talk of up-ending the fuselage and using it as an air-watch office.

I regret I cannot remember which of the fleet this particular aircraft was.

Weybridge, Surrey. E. J. NEWCOMBE.

IN BRIEF

F/O. B. Huxley, Adjutant of No. 28 Sqn., Royal Air Force, Sek Kong, Hong Kong, B.A.P.O.1, is compiling a scrapbook history of the unit. He has access to official records, but is short of personal reminiscences and photographs, and would be grateful to any former members of No. 28 Sqn. who could send any to him.

FORTHCOMING EVENTS

July 3. R.N.A.S. Ford: Air Day.
July 3. R.N.A.S. Eglinton: Air Day.
July 3. R.N.A.S. Bramcote: Air Day.
July 3-5. R.Ae.C. members' Deauville Rally.
July 3-5. Swiss watch rally, Bienne, Switzerland.
July 4. Cote d'Argent Aero Club: Rally, Royan, Charente Inférieure
July 8-12. British Institution of Radio Engineers: Industrial Electronics Convention, Oxford University.
July 9. College of Aeronautics Students' Society: Annual presentation ball, Cranfield.
July 10. R.N.A.S. Lossiemouth: Air Day.
July 10-11. International Radio Controlled Models Society: Annual contests, Birmingham.
July 10-12. R.Ae.C. members' La Baule rally.
July 18. Yorkshire Aeroplane Club: "At Home," Sherburn-in-Elmet.
July 18-25. Aero Club of Italy: International air week.
July 20-Aug. 4. B.G.A.: World Gliding Contests, Gt. Hucklow, Derbyshire.
July 24-26. World Model Aircraft Championships and Wakefield Trophy, Washington, U.S.A.
July 31. Ulster Flying Club: Newtonards rally.
July 31-Aug. 4. Trento Aero Club: Seventh air tour of the Dolomites.
Aug. 1-2. Vintage Aeroplane Club: Air rally and Chiltern air race, Denham.
Aug. 2-7. Aéro Club de France: World parachuting championship, St. Yan, Saône et Rhône.
Aug. 6-8. Royal Danish Aero Club: Invitation rally.
Aug. 9-11. Institute of the Aeronautical Sciences: Conference on turbine-powered air transport, Seattle, U.S.A.
Aug. 14. Royal Aero Club: National air towing competition, Cranfield.
Aug. 28. Southern Aero Club: Goodyear Trophy race, Shoreham.
Sept. 7-12. S.B.A.C. Farnborough display and exhibition.

LEDUC RAMJET INTERCEPTERS

Some Notes on Courageous French Private-Enterprise Developments

IT was in 1929 that M. René Leduc first began the development of the propulsive system which as now resulted in the Leduc 021 ramjet aircraft. From that year onwards, and even, on a limited scale, through the war years, he has continued development and testing of the concept. First result of the programme, which was carried on with only cursory official interest, was the Leduc 010, which flew soon after the war; many of its components had been constructed before the war, but in 1940 the German advance forced the designer to move to the South of France, and later that year to hide his equipment in farm-houses near Toulouse for the duration. The 010 was developed into the 016; both were research vehicles of comparatively low performance, air-launched from a carrier mounted on a Languedoc transport.

The most recent model to have flown is the 021. This is approximately twice as large as the 016 and correspondingly more powerful. It is, in fact, more a fighter prototype than an aerodynamic research vehicle, and is reportedly capable of carrying machine guns or cannon without major alterations. Its performance, although still subsonic, is in many ways spectacular, including a sea-level rate of climb of 39,420 ft/min. It has a span of 38ft 1in, length 41ft 1in, height 9ft and wing area of 238 sq ft. It weighs 8,350 lb empty and 13,200 lb all up. Limiting speed is 0.85 Mach, ceiling 65,000ft and endurance varies according to altitude between 15 min and 1 hr.

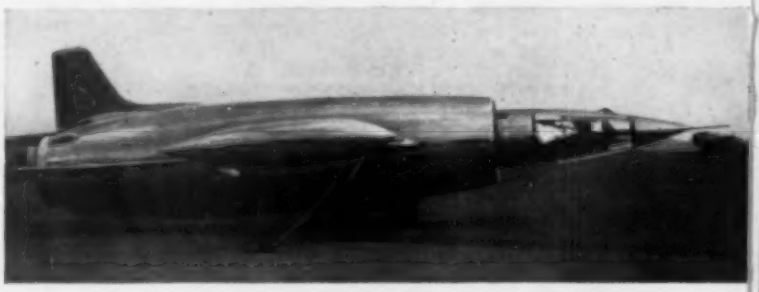
When first launched from its Languedoc carrier, the ramjet was lit before release while diving at 240 m.p.h. More recently the 021 has been released cold and then dived, lit and flown under power for some 20 minutes. Then all the remaining fuel is jettisoned and the machine landed dead stick. Since virtually the whole fuselage is taken up by the ramjet and ancillaries, fuel is carried between the wing spars, in integral tanks, and in two wing tip tanks. Though this may amount to some 400 gallons, it is not sufficient to give a really useful operational endurance.

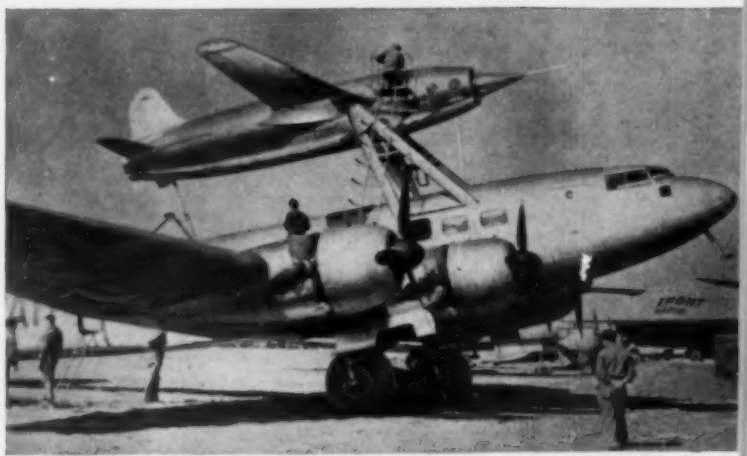
The 021 is a post-war aircraft; by contrast the 010 was first designed in 1937 although it did not fly till after the war. The 010 weighs 6,600 lb all up with a wing area of 173 sq ft, but is capable of 0.84 Mach. It will, moreover, maintain this speed in the climb with a rate of climb of 7,800 ft/min at 29,000ft. The 021's rate of climb, in comparison, falls off to 2,900 ft/min at 49,000ft.

The design of the two aircraft is interesting. Because they came before their time, and because of a lack of official interest and backing, many of the problems associated with high-altitude and high-speed flight had to be solved by M. Leduc before they even arose for other manufacturers. He had to design his own *monotrace* undercarriage, fuel pump and controls, powered flight controls, pressurized cabin and pilot-escape mechanism. Due to the considerable fuel-flow to be accepted, a turbine-driven fuel pump was built and run in 1940, and the power controls originally designed have been taken up for development by the Société Jacottet. His cabins have all been completely sealed, air-conditioned, pressurized and jettisonable.

The undercarriage consists of a tandem two-wheel retracting main unit, assisted by a tailwheel and two outrigger wheels mounted in keel fairings under the wing-tip tanks. Whereas the cabin of the 010 was partly buried in the main tube, that of the 021 is completely free of the main fuselage and, moreover, almost completely cased in transparent material, affording the pilot a vastly improved view. The whole plastic cone slides forward on its supporting shaft to allow access; only one circular joint requires to be sealed. Parachutes to lower the cabin after jettisoning are stowed behind the pilot. The 021's fuel pumps and generators are driven by a Turboméca Artouste shaft-drive turbine mounted behind the cabin.

Fuel is sprayed into the tube through seven banks of three rows of burners, with a separate fuel supply for each bank. Thus, the banks can be lit progressively, according to speed or other factors. The fuel pump has a capacity of 126 gal/min.





The view of the 021 (top) may be compared with that of the 016. The pilot's cabin is completely clear of the main tube. The 021 has approximately twice the power of the 016. The Leduc 021, seen head-on, shows the concentric pilot's cabin, air intake and banks of fuel injectors and their flame holders. Daylight can be seen through the fuselage. Seen soon after the war, the Leduc 016, immediately above, is mounted on the Languedoc and being prepared for flight. Three Languedocs have been modified as carriers.

The first ostensibly operational fighter version will be the Leduc 022. This will be capable of Mach 2 at altitude, and will have a S.N.E.C.M.A. Atar of unspecified mark mounted behind the cabin (inside the ramjet) to permit the machine to take-off under its own power. M. Leduc has so far released no details of this machine and, though it is probably under construction, it is not known when it will first take the air.

The 021 is at present being test flown at the summer head-quarters of the Centre d'Essais en Vol (French Boscombe Down) at Istres, near Marseille. The three modified Languedoc carriers are there, together with the special gantry for hoisting the ramjet up onto the carrier. An official colour film has also been made of some of the flights and privately shown in France.

5 VERSIONS IN SERVICE

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A.R.B. PROGRESS

Work of the Board During the Last Year

A REMINDER of the wide scope of the Air Registration Board's work, and an indication of the major problems encountered, can be gained from a study of the Board's seventeenth annual report, which was due to be presented by Lord Brabazon of Tara yesterday, July 1st. After a general introduction, the report deals in turn with I.C.A.O., British civil airworthiness requirements, civil aircraft inspection procedures, flight testing, power plant developments, radio installations, examination and licensing of personnel, flight manuals, service and instruction manuals, and the Board's own finance, council and staff. Extracts from the more significant parts of Lord Brabazon's report follow.

Introduction.—"The most important feature in civil aviation activities during the past year has, undoubtedly, been the operation of turbine-engined transport aircraft on scheduled passenger services. The commencement of these operations has not been trouble-free and indeed, looking back over the years, it is clear that all great changes, all moves towards the adoption of the new or the unorthodox and all attempts to explore the hitherto unknown have been accompanied by risks unknown and dangers unseen. I am, however, convinced that we are right to extend ourselves to the utmost to maintain our lead in this field and to use all the knowledge at our command to improve that lead.

"The Board is continuously facing fresh problems in its tasks of investigating new designs, particularly in regard to the use of complicated systems of various kinds. The necessity for these systems arises fundamentally from the broad operational requirements for payloads, speed, range, comfort and world-wide use. The designer cannot produce a simple aeroplane which fulfils all operational demands. The introduction of each system results in the addition of a set of potential risks but these are, of course, minimized by basic design.

"The following items illustrate other kinds of problems which are engaging the Board's attention:—

(i) The problem of the introduction of a realistic form of simulated feel in powered control systems.

(ii) The incidence of fatigue in high-tensile aluminium alloys used in aircraft primary structures.

(iii) The possible need to stop pure jet engines in flight in order to reduce fire risk in a defective engine and to prevent engine break-up; and the use of reverse thrust for braking purposes.

(iv) The need for a suitable form of fuel heating to prevent the icing of fuel systems at high altitude with consequent loss of engine power.

(v) The introduction of non-inflammable hydraulic fluid systems to eliminate one of the present fire hazards.

"In the international field the Board has been vigorously pursuing the objective of automatic reciprocal validation of certificates of airworthiness, and discussions on this theme have continued with the American Civil Aeronautics Administration."

During the past year, the report continued, representatives from Australia, India, Finland, Germany and Japan had spent considerable time studying the Board's methods in the certification of aircraft, the licensing of personnel and general procedures followed in associated matters.

British Civil Airworthiness Requirements.—"Two sections of British Civil Airworthiness Requirements have been reissued during the past year and preparation is proceeding for the reissue of a further two sections.

"The Rotorcraft Requirements Co-ordinating Committee considered that the experience gained with the provisional issue of Section G—Rotorcraft—was such that this section could now be issued with full requirement status. Accordingly Issue 1 of Section G was published on 1st January, 1954, and included a new Type Test Schedule for engines and transmission systems of helicopters using piston engines, together with new requirements relating to the sequence of testing prototype helicopters.

"Section A was reissued on 1st May, 1954, to take account of changes in the procedure for the approval of radio apparatus and airframe parts and equipment and to reflect the present position in relation to the approval of flight manuals. Additions were also made to the chapters on engine approval, and service and instruction manuals."

Civil Aircraft Inspection Procedures.—"Fifty-eight leaflets have now been published in Civil Aircraft Inspection Procedures and have materially assisted in the establishment of a recognized code of sound maintenance and workshop practice. The leaflets vary in scope and treatment; some restate accepted principles for the benefit of the uninitiated, others give guidance on issues which may be controversial or widely misunderstood. There is a continuous demand for these leaflets from aircraft engineers in many parts of the world."

Flight Testing.—"The Board's work on test flying continues to expand and covers a large range of aircraft tested for a variety of purposes. In the process of investigations on prototype aircraft, flight testing was undertaken on the Dart Kitten, Prestwick Pioneer, Percival Pembroke, de Havilland Heron 2, Blackburn Universal Freighter, de Havilland Comets 2 and 2X and Bristol Britannia aircraft."

Power Plant Developments.—"Piston-engine development continues on a small scale, only five new types being approved by the Board during the last twelve months. Some development of a large compound piston engine is still proceeding, but in view of the time delay its future appears increasingly obscure. Several new marks of air-cooled in-line engines in the small power range are coming forward slowly, but all these appear to be developments of existing types. It is notable and regrettable that no suitable engine for ultra-light aircraft has yet been produced.

"Gas turbine development proceeds apace, though only two turbojet engines and one turbo-propeller engine have been given type approval during the last twelve months. All these are in the medium or large power categories.

"The Dart turbo-propeller engine in the Viscount is now giving an excellent performance, and over 80,000 engine flying hours have been accumulated. Similarly the Ghost turbojet engine in the Comet has shown increasing reliability and life between overhauls with passage of time, and has now achieved over 135,000 engine flying hours to date."

Licensing of Personnel (Aircraft maintenance engineers).—"The number of examinations held for the grant or variation of Aircraft Maintenance Engineers' Licences is slightly below that of the previous year. The majority of the examinations have been in connection with the extension of licences for the new types of aircraft and engines brought into service during the past year or so, and for older types transferred to new operators."

Licensing of Personnel (Pilots' technical examination).—"Two papers are set in respect of the issue of a pilot's licence; Part 1 deals with general aeronautical matters and Part 2 relates particularly to the type of aircraft for which the licence is sought.

"During the past twelve months only 50 per cent of the total number of applicants for licences were successful and 70 per cent of all applicants were required to take a section of the examination at least twice before the final decision as to pass or fail was reached.

"An unduly high initial failure rate in the examination is caused by a lack of basic knowledge of the aircraft type. In some measure this is due to the increasing complexity of contemporary designs, but a more fundamental reason is connected with the gradual disappearance of four-engined aircraft from the R.A.F., which has long been and still is the nursery for pilots in civil aviation."

Flight Manuals.—"The preparation of flight manuals is now a well established procedure which functions smoothly. During the year manuals for new types of aircraft included more recent marks of the Viscount and the Comet, and the Bristol 171 helicopter. The total number of types having flight manuals is now twenty-three. Approximately 250 manuals have been issued to aircraft, while approximately 650 specimen copies have been distributed at the request of various authorities in many parts of the world."

Service and Instruction Manuals.—"Several years ago, I reported that although there was some improvement in the standard of maintenance and repair manuals published by manufacturers, the results were not proportionate to the amount of advice and help given by the Board's staff. Some manufacturers tended to rely on their publicity departments for the production of manuals but they have been encouraged to establish proper technical publication departments staffed with technicians. Bearing in mind that at the present time there is a notable shortage in industry of suitably qualified staff the improvement over the last two to three years is exceedingly gratifying.

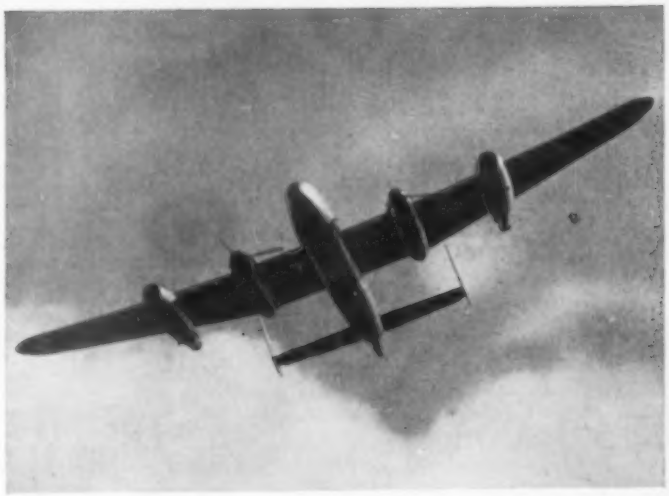
"The number of manuals submitted to and approved by the Board has increased enormously and for each new aircraft now delivered there is a comprehensive set of manuals covering all aspects of the aircraft and its operation, maintenance and overhaul. For a large transport aircraft each set of manuals may cost as much as £1,000 per aircraft delivered but it is considered that this cost is not unreasonable, having regard to the improved serviceability engendered by their availability."

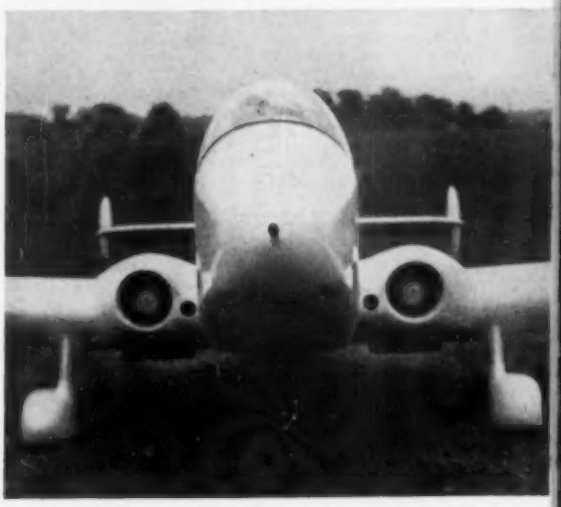
A.R.B. Council.—Four members of the Board had retired according to normal procedure, the report stated, and had been reappointed for a further four years. They were Col. R. L. Preston (representing operators), Sir Frederick Handley Page (constructors), Mr. L. Murray Stewart (insurers) and Sir Maurice Denny (independent).

Away together for the start of the Royal Aero Club Trophy Race; D. C. Jemmett's Hawk Trainer and Tim Wood's Messenger (which went on to win the King's Cup).

BAGINTON MISCELLANY

Great white hope: two views of Dunkerley's Sparrowjet, prevented from racing by a blockage in the air lead from the starting bottles. Its "ugly duckling" appearance on the ground was belied by its swift grace in the air on Saturday.





On display: (above) the Sapphire-Lancastrian, a surprise item on the flying programme, disdained piston power for its low run. (Below) The development of the light aeroplane was illustrated by (left) the Club Cadet and the Spartan Arrow and (right) the Tom-Tit, Puss Moth, Cirrus Moth and Cygnet, amongst others.

INDIAN EXPRESS: Air-India's new Super Constellation service between London and Bombay was inaugurated on June 21st. The aircraft is shown before departure from L.A.P., with the newly unveiled Alcock and Brown memorial in the foreground.

CIVIL AVIATION

DECCA IN ACTION

ON many occasions in the past *Flight* has described the uses and development of the Decca system of navigation. We have firmly advocated its adoption as a standard aid for aviation as well as for shipping, although we are aware of the arguments against it. These emanate largely from America, which prefers to back its own less flexible system. It seems probable that Decca will, in fact, become a standard European aid not only for shipping but for aircraft—including, of course, helicopters, for which it offers unique qualities.

Recently we had the opportunity to fly an executive Prince on the Paris-London route and to remind ourselves of the simple and effective navigation and fixing service offered by a Decca Flight Log and to practise some simple plotting to maintain track, using only a pair of Deccometers.

A particular interest applies to this aircraft and its captain in view of a narrow escape which they experienced together some time ago and of which the story can now be told. Some similarity with the circumstances of the recent Swissair Convair ditching accident will be noted. The details are perhaps best set forth in the words of Captain Poulter as written in a letter to Decca. We quote:

"You may remember my mentioning that I had been involved in an incident in which our Decca installation passed what was to me the supreme test. I am now at liberty to let you have details of this occurrence, which will probably be of considerable interest to you in view of the part played by the Decca Navigator and (in particular) the Flight Log.

"The aircraft concerned is a modern, twin-engined machine belonging to the Standard Motor Company, Ltd., used for carrying company executives and staff on urgent journeys. We were en route from Stuttgart to Birmingham, and had been maintaining track with the Flight Log having been in or over total cloud the whole way. Cross-checking with the radio beacons and ranges had proved that the trace was absolutely accurate.

"Ten miles north-east of Manston, at six thousand feet, both engines stopped in rapid succession, giving only very short bursts thereafter. It was decided to try to reach Manston rather than to ditch near the shore, and accordingly a course was set with the aid of the Flight Log to take us west of the field so as to avoid Ramsgate. Unfortunately, turbulent air caused the aircraft to lose height much more rapidly, so that when we broke cloud at about five hundred feet we were not lined up with the runway. We were, however, able to make a wheels-down landing on the airfield. Although the aircraft was slightly damaged, no passengers or crew were injured.

"Without the Flight Log, which not only showed us the whole navigational picture at a glance but also allowed us to set the correct course immediately, it would have been madness to attempt a landing on the airfield at all. One wonders how many other bad accidents could have been avoided had Decca been available to the pilot.

"Incidentally, I have calculated that only twenty minutes' flying saved per week pays your hiring charge, and in fact time is cut on almost every flight by the elimination of small navigational errors and by the ability to place the aircraft for 'straight-in' approaches under even the worst conditions."

The views of another professional pilot were expressed a month or two ago in an official report to his company—one of the major European airlines—following a test he made with Decca equipment. Some translated extracts have been shown to us; they read as follows:

We climbed out of Geneva in I.F.R. conditions only with the aid of the Flight Log, the equipment operating perfectly from the start. Because the ground speed can be easily read from the Flight Log the E.T.As are always precise to the minute, every necessary correction of the drift angle is immediately noticeable . . . The precision of the Flight Log indication is completely independent of altitude or geographical structure. From Le Bourget to Croydon we flew at 4,500ft mostly I.F.R. We could not get an I.F.R. clearance and had even to leave the airway with a re-entering time at Ashford. With any other radio aid the execution of that precisely prescribed manœuvre would be most difficult . . . A holding pattern can be flown at any point. The weather at Croydon was visibility 1,200yd, ceiling 300ft with fog. The airport had no beacons or any other approach facilities. On the usual airport charts the finals for a specific runway are marked; on the map we used there was no detailed information. Downwind was reported still being completely I.F.R., but on breaking cloud on finals we were dead on the

V.I.P. TRIO: Three B.E.A. Bristol 171s in formation at Northolt; aboard the helicopters at the time were Lord Douglas of Kirtleside, Mr. A. T. Lennox-Boyd and the Mayors of Southampton and Eastleigh. The occasion was the opening, on June 15th, of B.E.A.'s helicopter service between L.A.P and Southampton. After the Mayors had been welcomed at the city's main airport, they flew on to Northolt for the official luncheon.

CIVIL AVIATION . . .

centre line over the approach lights. Precisely such an approach seems most remarkable to me in view of the possibility of an emergency landing on any airfield without local approach aids. Precision approaches can be made anywhere within a 150-mile radius of the master.

Italian and Swedish chains are under consideration (the report continues) and with their aid the company's complete network of European services would be covered. A Decca system planned for the South Atlantic will be capable of giving fixing accuracy of 10 to 15 miles. It is also noted that B.E.A. Viscounts are Decca equipped, and to speed up the outbound traffic from London these aircraft can be given Decca clearance enabling them to climb and fly out of the zone on a predetermined track, which is completely independent of the existing aids system. The re-entering of the airway is then possible at any chosen point. Block times might be shortened very much by this procedure. As position is given so accurately (by the Flight Log) it is possible to fly the shortest distance between points and thus to shorten flight time. Interference due to thunderstorms, static, etc., are seemingly kept within such limits that the control by the Flight Log would not be impaired.

MARATHONS FOR JAPAN

LAST Tuesday afternoon, the first of two Handley Page Marathons for Far Eastern Airlines was handed over at Reading. It was received by Admiral Todomu Nakamura, aviation manager of C. Itoh and Co., Handley Page's agents in Japan. The second machine will be ready in about two weeks' time.

Both these Marathons are completely new, have been fitted with additional radio to meet Japanese requirements, and are equipped as 20-seaters. With this payload the range is 1,330 miles at 165 m.p.h. The engines are four Gipsy Queen 70-4s (340 h.p.), and the all-up weight is 18,250 lb.

TASMAN SOLENTS WITHDRAWN

ON Monday last Tasman Empire Airways were due to complete the change-over from flying-boats to landplanes for their services between Australia and New Zealand. Three routes (Sydney-Auckland, Sydney-Christchurch and Melbourne- Christchurch) are flown—all with DC-6s formerly used by B.C.P.A. The last scheduled Tasman crossing by a Solent, from Sydney to Auckland, was to take place on Sunday. Use of landplanes has not only reduced journey-time between Australia and New Zealand, but has made possible the introduction of tourist fares (the DC-6s have separate cabins for the two classes of passengers).

IMPROVING KAI TAK

SOME details have recently been announced of the plan approved by the Hong Kong Government for developing Kai Tak Airport. The plan, devised by the Department of Civil Aviation, envisages 24-hour operation of all types of aircraft likely to be used during the next 10-15 years. At present the physical limitations of Kai Tak make it necessary for operators to arrange their schedules round a 12-hour stopover there.

LONG-TERM PLAN: As reported above, the Hong Kong Government has approved a £6m plan for much-needed improvements to Kai Tak Airport. However, the new 135-315 runway illustrated here is not expected to be ready until 1958. Provision is made for the operation of large flying-boats from Kowloon Bay.

As illustrated on this page, the improved airport will have a new runway—7,200ft × 200ft, and capable of taking aircraft up to 200,000 lb—built on reclaimed land in Kowloon Bay. The terminal area, consisting of a parking area, maintenance area and terminal building, will be built partly on the site of the present airport and partly on reclaimed land. It is hoped that by the time the new runway is ready for use (early in 1958), the following minima will be in force: day, 600ft cloudbase, 2 miles visibility; night, 800ft cloudbase, 3 miles visibility. Modern approach and runway lighting systems are to be installed. Total cost of developing Kai Tak will be in the region of £6m, including £500,000 worth of work to R.A.F. requirements.

B.O.A.C. APPOINTMENT

IN addition to his present duties as financial comptroller of B.O.A.C., Mr. Basil Smallpiece will in future hold the appointment of deputy chief executive. This is announced by the Corporation's chairman and chief executive, Sir Miles Thomas. In the absence of Sir Miles, Mr. Whitney Straight, as deputy chairman, is responsible for the performance of all duties normally exercised by the chairman.

PREMIER'S ATLANTIC CROSSING

FLYING in B.O.A.C. Stratocruiser *Canopus*, Sir Winston Churchill and Mr. Eden travelled from London to Washington in 18¼ hr elapsed time on June 24-25th. Actual flying time for the 3,716-mile journey was 16 hr 6 min. The Prime Minister's aircraft left London at 1900 hr G.M.T. on June 24th and reached Gander 10¼ hr later after an uneventful flight at 14,000ft. After a 1 hr 49 min stop at Gander, *Canopus* flew "airways" to Washington in 5 hr 21 min. Sir Winston and Mr. Eden disembarked precisely on schedule at 1300 hr. G.M.T. on June 25th. The aircraft was commanded by Capt. Donald Anderson, who has made some 430 Atlantic crossings over the past 14 years.

THE SWISSAIR ACCIDENT

OFFICIAL investigations into the recent loss of a Convair 240 of Swissair are now being conducted by the M.T.C.A., whose report has not yet been published. Meanwhile, it has been announced in Switzerland that the aircraft had not been refuelled at Geneva before taking off for London. The Convair descended into the English Channel on June 19th with the loss of three lives.

OTTER'S LONG HOP

AN Otter bought recently from de Havilland Aircraft of Canada by a Norwegian operator was recently damaged during delivery by sea. The aircraft had been dismantled, crated and lashed to the deck of a Norway-bound freighter, but a storm at sea snapped the retaining cables and the crate was severely battered.

To enable the operator (Wideroe's Flyveselskap Og Polarfly) to introduce Otter services on schedule, it was decided to deliver a second aircraft—by air. Fleetways, Inc., of Burbank, were selected for the task of delivery, and the Otter was fitted with a 182-gallon long-range tank mounted in the 14-seat cabin. Fuel capacity was thus increased to a total of 361 gallons, and range extended to 2,000 miles.

The Otter left Downsview Airport, Toronto, on June 21st and arrived at Stavanger last Friday, June 25th. Refuelling stops were made at Goose Bay, Bluie West One and Keflavik.

Since 1946 Fleetways have completed 4,500 long-range delivery flights. The Otter was ferried by pilot Jack Ford and navigator Walter Henderson. They are returning to Canada shortly with an executive Heron for Canadian Comstock.

LONGER U.S. DOMESTIC FLIGHTS

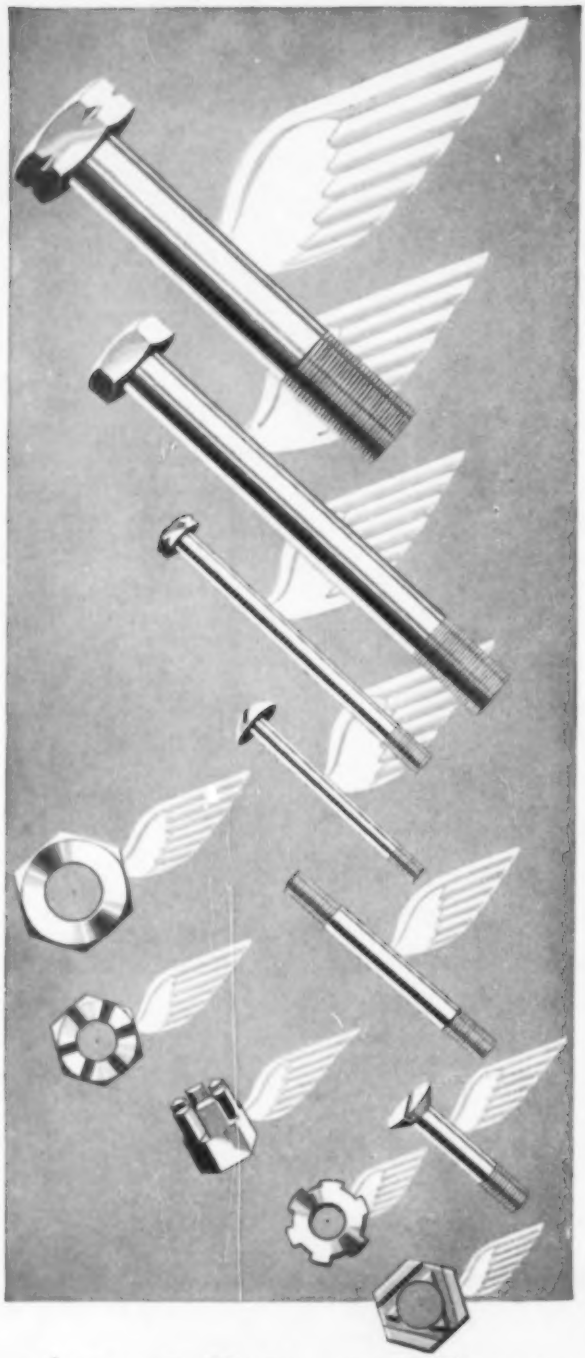
AN American civil air regulation in force since 1931 has been waived by the C.A.B. to permit continued two-way operation of the new coast-to-coast service. The regulation concerned is the so-called "eight-hour rule," which virtually prohibits domestic airlines from scheduling non-stop flights of more than eight hours' duration. Until recently no operator of U.S. domestic services had aircraft capable of flying eight-hour stages without sacrifice of payload.

The situation was changed by the introduction of the DC-7 and L1049C Super Constellation. In May American Airlines, T.W.A. and United Air Lines all applied for permission to continue flying trans-continental services non-stop regardless of the eight-hour rule. Flight times scheduled by American Airlines and T.W.A. for the eastbound crossing are 7 hr 15 min and 7 hr 55 min respectively. Experience since the end of last year has shown that these schedules can be made good. American Airlines, however, also fly westbound non-stop against prevailing winds. Though originally scheduled to come within the eight-hour rule, westbound DC-7 flights have averaged around 8¼ hr.

A special regulation legalizing continued operation of the westbound service was adopted by the C.A.B. on June 14th, taking effect immediately. The regulation, applying only to scheduled

The completion of Ferryfield marks the latest stage in the development of the cross-Channel Air Ferry.

Silver City Airways Ltd. is glad therefore to record its thanks and appreciation, not only to the contractors, sub-contractors, equipment suppliers and workpeople engaged in building Ferryfield, but also to all those companies in the air transport industry as well as members of the Press whose interest and collaboration has contributed to the Air Ferry story.



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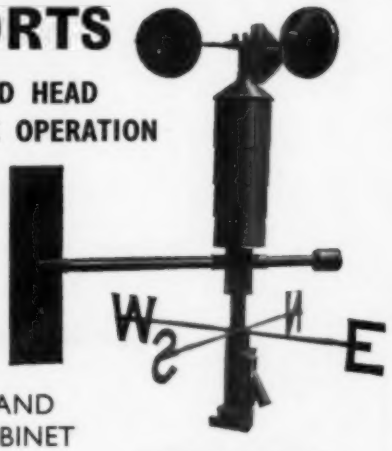

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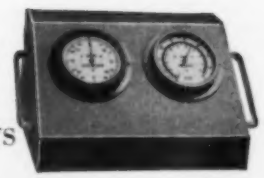

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MAKERS OF ANEMOMETERS FOR EIGHTY YEARS

SIGNAL BOX: This neat control desk is installed at Ferryfield, the new Silver City airport described elsewhere in this issue. It was built by Racal, Ltd., who installed all the radio and communications services at Ferryfield, including equipment provided by the M.T.C.A.

CIVIL AVIATION . . .

transcontinental services, extends the time limit to 10 hours, provided that flights are conducted in pressurized aircraft crewed by at least two pilots and a flight engineer.

In adopting the new regulation, the Board noted that for nine years overseas flights of up to 12 hours had been conducted by three-man crews (including two pilots) without any decrease in safety standards. It was also noted that, in the C.A.B.'s experience, the probability of an accident was more closely related to the number of flights, *i.e.*, the number of take-offs and landings, than to the duration of flight.

The special regulation was passed by the chairman, vice-chairman and one member of the Board. Two members dissented. It was also opposed by the Air Line Pilots Association, although the Board was advised that pilots preferred the non-stop operation—which made it possible for maximum monthly flight time to be logged in 10 days instead of 15.

NEW SERVICES APPROVED

APPROVAL of the following new services is announced by the Ministry of Transport and Civil Aviation: —

Inclusive Tour Services

(i) Between Lympne and Basle; Air Kruise (Kent), Ltd., until October 31st, 1954.
(ii) Between Southend and Calvi via a technical stop at Lyons; Dan-Air Services, Ltd., until September 26th, 1954.
(iii) Between Bovingdon and Basle; Hunting-Clan Air Transport, Ltd., until August 22nd, 1954.
(iv) Between Bovingdon and Munich; Hunting-Clan Air Transport, Ltd., until August 29th, 1954.
(v) Between London (Croydon or Gatwick) and Nice; Transair, Ltd., until September 9th, 1954.

Normal Scheduled Services

(vi) London - Frankfurt and/or Dusseldorf and/or Rome - Cairo or Beirut - Khartoum - Entebbe or Nairobi - Salisbury (Kentucky Farm) - Johannesburg; British Overseas Airways Corporation, until March 31st, 1961. (Operations into Salisbury are dependent upon the availability and suitability of Kentucky Farm aerodrome for operation by the Corporation's aircraft.)

Colonial Coach Class Services

(vii) London (Blackbushe) - Bathurst - Freetown - Accra; Airwork, Ltd., until March 31st, 1957.
(viii) London (Bovingdon) - Bathurst - Freetown - Accra; Hunting-Clan Air Transport, Ltd., until March 31st, 1957.

Helicopter Service

(ix) Between London Airport and Southampton (Eastleigh); British European Airways Corporation, until June 13th, 1955.

The Minister, after considering the recommendations of the Air Transport Advisory Council has also approved the following applications for amendments to air services: —

(a) The inclusion of Stavanger as an optional traffic stop on the Normal Scheduled services operated by Hunting-Clan Air Transport, Ltd., on the route Newcastle - Oslo - Stockholm.
(b) An extension to the period of approval of the Internal Service operated between London (Croydon) and Birmingham (Castle Bromwich) by Olley Air Service, Ltd., to permit operation during the period of the British Industries Fair each year up to and including 1960.
(c) The operation of an Internal service in place of an Inclusive Tour service by B.K.S. Air Transport, Ltd., between Newcastle and/or West Hartlepool - Bembridge (I.O.W.).

AUSTRALIA'S FIRST Viscount is partly shown in this new photograph from Vickers' Hurn factory. The three Trans-Australian Airlines engineers standing by the newly painted nose are (left to right) Messrs. S. Berrie, P. Henry and J. Taylor.

BREVITIES

A BUDGET for 1955 of $2,745,260 (Canadian) was approved at the eighth annual assembly of I.C.A.O., which ended in Montreal on June 14th. The sum, most of which will be obtained in contributions from the 63 member nations, shows a $15,000 increase on the current year's budget.

* * *

One of Pan American's DC-6Bs is being fitted with Bendix RDR-1 cloud-collision warning radar for a three-month period of service trials throughout the company's routes. The equipment weighs 200 lb and cost approximately £8,900 installed.

* * *

Registrations for Hunting-Clan's Viscount 732s are given as G-ANNR-T inclusive in the current issue of the *Register of British Civil Aircraft*.

* * *

Selfridge's, the London store, claim that a consignment of pressure cookers flown to the South Bank on their behalf on June 21st was the first helicopter freight to reach central London. The cargo was brought from Derbyshire by an S-51 of Autair, Ltd.

* * *

Mr. Byron H. Rogers has been appointed European sales manager for American Airlines, with headquarters in the Time and Life Building, London. He succeeds Mr. W. G. Conrad, who is returning to the United States.

* * *

Works inspector at the B.O.A.C. repair factories, Treforest, since November 1944, Mr. S. W. S. Cockram, B.E.M., has just retired from the Corporation. Mr. Cockram joined Imperial Airways at Croydon in 1937.

* * *

The Eagle Airways scheduled services to Aalborg and Gothenburg ceased to operate on July 1st; the weekly return service to Belgrade is being continued.

* * *

The new Lockheed Service International hangar at Idlewild, opened on June 17th, is the largest independent maintenance base on America's eastern seaboard. Built at a total cost of £1.4m, it will house seven large four-engined transports and has apron space for a further 15.

WEST-COUNTRY AIR DAY

Blue Skies, Devonshire Accents and a Nautical Emphasis

THREE and a half nautical miles North-north-east of Plymouth Hoe, according to the *Air Touring Guide to Europe*, lies Plymouth (Roborough) Aerodrome. This fact we verified on Saturday last, as *Flight's* Gemini approached in the space between the Devon moors and a thick blanket of stratus. The occasion was Plymouth's 1954 Air Display and, thanks to an improvement in the weather, excellent flying by the participating pilots and the large amount of preparatory work that had obviously been done, it was a most successful meeting.

The sharp droning of two control-line models in the distance formed a background to the speech, opening the display, by Admiral Sir Alexander Madden, C-in-C. Plymouth, who had been introduced by the Chairman of the Air Display Committee, A.V-M. T. C. Traill. Dead on time, the flying programme was opened by a trio of Coastal Command Sunderlands from Pembroke Dock, whose low run past the enclosures was followed by a discreet "Prince of Wales' Feathers."

An impeccable sailplane display in a Prefect flown by F. Mares, an A.T.C. Instructor at No. 84 Gliding School, Exeter, was hardly over before the words "Warning. Keep clear of tail rotor" were being waved about just in front of the crowd. This instruction was attached to the boom of a white R.A.F. Sycamore helicopter which proceeded to give a vigorous and refreshingly different demonstration of what rotating wings can do, with an emphasis on steep turns, pendulum swings and nose-up manœuvres with the tail-skid lightly brushing the grass. The pilot responsible for all this was F/O. Meyrick, from St. Mawgan.

Four Sea Hawks from 704 Squadron next burst in to give contrast to the preceding events. Formation loops (into cloud) and a low-speed run by three machines alternated with a brisk individual show, before the pace changed again to Chipmunk aerobatics, announced to the public over the R.T. by the pilot.

The first of the Army's contributions to the combined-operation programme consisted of the sudden appearance of a jeep carrying a Sergeant and seven men who proceeded to take the vehicle to bits in just over two minutes. After reassembling it in just *under* two minutes they drove off with rapidity and a sense of achievement.

From Binbrook, three Canberras then arrived to give a polished though restrained demonstration, followed by an individual performance by a fourth machine. After a Naval Dragonfly helicopter had rescued a pilot from his dinghy, adrift on the grass in front of the Chairman's enclosure, the North Luffenham Sabre team—such effective participants at Coventry one week earlier—arrived with a roar and a three-pronged trail of smoke to begin an equally excellent repeat performance, Below the crest of the moors to the east their trails disappeared as they began their second run; then across and up again, rolling through a patch of blue sky as the sun glinted on their close-fitting swept wings. The Sabres' fast and low individual beat-ups completed, the local populace breathed again.

A ground display of alarming activity by P.T.I.s from Collaton Cross was followed by the appearance of a Coastal Command Hastings from Aldergrove ("which gathers met. reports" the commentator revealed, "which assist the forecasters to be as wrong as they were yesterday")—and of much blue sky, with cumulus tufts, as a sharp backdrop. Before this backdrop three Neptunes from Topcliffe gave one of the best P2V displays we have seen. After a low run in formation, one remained circling tightly above the airfield as its colleagues performed.

Shackletons of Coastal Command from St. Eval provided the next act, flying past on one, two, three and four Griffons in turn and permitting a pair of Army Bofors gun teams to fire at them. Four U.S.A.F. F-86F Sabres from Manston then put in a short, sharp and smoky appearance, before a grounded Sea Hornet was set on fire to provide St. Eval fire-fighters with a spot of practice. The final event on the programme was a march-past by the bands of the Royal Artillery and R.A.F., at which Admiral Madden took the salute.

The excellent static show attracted many of the twenty thousand people present, both before and after the flying. Variety was here the keynote, with contributions from the Navy, Royal Marines, R.A.F., Army, Civil Defence Corps, A.T.C., R.A.F.A., the Plymouth Aircraft Recognition Society and others. One of the main contributions was undoubtedly the display by the R.N. Engineering College, Manadon, which included some of the College's aircraft, a number of nicely sectioned power plants and a college-built mobile test rig on which was mounted a Derwent 5 turbojet. This test rig was, of course, a crowd-attracting winner: no photographs of "Life in the R.A.F." could compete as the starting-up whine of the Derwent, magnet-like, attracted the small-boy iron filings.

In the hangar nearby, enthusiasts had spotted the runner-up and third machine home in the previous week's King's Cup Race: the Plymouth and District Aero Club's Messenger G-AKBM flown by D'Arcy, and Miss F. M. Leaf's cream Hawk Major G-ACYO.

The R.A.F.'s Canberra cockpit mock-up, too, was in great demand; nearby stood a half-scale model of the complete machine, and also a real, live Venom. As we finally left the display, we noticed a rangefinder (one of the warlike exhibits of No. 47 Coast Regiment, R.A.) being used to good effect by a keen bunch of young soldiers. "Left—left again" ordered the observer to the operator. "That's it. Good. Now have a look at that blonde in green."

K.T.O.

The precision that is coming to be known as North Luffenham's own: the R.C.A.F. Sabres, presenting their planforms in a zoom climb.

A most impressive demonstration was given by three Lockheed Neptunes from Topcliffe. Here one is seen on a low run past the field.

"Flight" photographs

SERVICE AVIATION

Royal Air Force and Fleet Air Arm News

A.O.C. Singapore

AFTER having been S.A.S.O. at No. 19 Group, Coastal Command since last October, G/C. A. E. Clouston, D.S.O., D.F.C., A.F.C., is to become A.O.C. Singapore. He will assume the acting rank of Air Commodore.

Before going to No. 19 Group A. Cdre. Clouston commanded the Empire Test Pilots' School at Farnborough and in 1947 he went to the R.N.Z.A.F. on interchange duty.

F.T.C. Garden Party

FLYING Training Command headquarters at Shinfield Park, Reading, was the venue for a pleasant garden party last Saturday. The hosts were the Air Officer Commanding-in-Chief, Air Marshal L. F. Pendred, C.B., M.B.E., D.F.C., and officers. The occasion was purely a social one—aircraft took no part at all—and the entertainment was provided by sport in the form of cricket and tennis matches.

Examining Wing Team Returns

HEADED by W/C. D. G. Lister, D.S.O., D.F.C., A.F.C., who commands the Examining Wing of the Central Flying School, a team of nine examining officers has just completed a 12,000-mile tour of the M.E.A.F.

The purpose of the tour, which is an annual duty, is to assess the standard of instructional technique and to examine training methods. Instrument-flying standards are also checked.

In addition to this annual visit to the Middle East, other tours are made to the Far East Air Force and Germany. Regular inspections of units in Britain are also undertaken.

Greenland Expedition Completed

AT the end of this month Coastal Command Sunderlands from Pembroke Dock will fly into the Arctic Circle to bring home members of the British North Greenland Expedition on the completion of their task. This will be the fourth successive year that the R.A.F. has co-operated with the B.N.G.E.

The Sunderlands will collect 21 members of the expedition and their equipment from the base camp at Britannia Lake, which lies 190 miles inland from Young Sound.

Vickers Trophy

ALTHOUGH only in its first year as a transport unit, No. 84 Squadron has won the Vickers Trophy. Runners-up were the Aden Communications Squadron and No. 114 Squadron. The Trophy was presented at a parade held at Fayid in the Canal Zone by Air Marshal Sir Claude Pelly, C-in-C., M.E.A.F.

No. 84 Squadron, commanded by S/L. H. Jenkins, was previously a light bomber unit operating in Malaya.

LE PATROUILLE DE FRANCE: Four Dassault Ouragans, under the command of Capt. Labaye, of the French Air Force, performing before a very damp crowd at the eighth annual R.A.F.A. display at Sydenham Airport, Belfast. Low cloud and rain severely restricted the Ouragans' display.

Sir Hugh Saunders

ON June 24th, Air Marshal Sir Hugh Saunders arrived in Copenhagen to take up his appointment as a technical adviser to the Danish Air Force.

R.Aux.A.F. Appointment

THE Air Ministry has announced the appointment of S/L. F. E. Clark to command No. 3512 (County of Devon—Exeter) Fighter Control Unit.

S/L. Clark holds a Regular commission in the R.A.F. In 1945 he was a member of the High Speed Flight, which at that time was engaged in beating the world's speed record with a Meteor 4.

Poaching

ATTENTION has been drawn to a paragraph, which appeared on these pages last January, concerning the new Cranwell magazine, "The Poacher." In this it was stated that the new magazine would cover the activities of the R.A.F. College whereas actually it deals only with station affairs. "The Journal of the Royal Air Force College" continues to be the official organ of the College.

No. 12 Squadron Standard

AT Binbrook on June 23rd No. 12 Squadron received its Standard. The presentation was made by Marshal of the R.A.F. Lord Newall, who was the unit's first commanding officer when it was formed in 1915. The present C.O. is S/L. F. C. D. Wright, D.F.C.

From its long and distinguished history No. 12 has selected the following eight battle honours for its Standard: Loos—Cambrai 1917—Somme 1918—France and Low Countries 1939-40—Meuse Bridges—Ruhr 1941-45—Berlin—Rhine.

It will be remembered that No. 12 Squadron supplied the Canberras and crews that flew the goodwill mission to South America in 1952. The mask of a fox which forms the squadron badge dates back to 1925 when No. 12 was the only unit to be equipped with—for those days—super-performance Fairey Fox light bombers.

No. 12 SQUADRON STANDARD is marched past. The Standard Party are, M.Nav. E. R. Buttle, Sgt. H. Blackburn, F/O. A. G. Harris and Sen.Tech. J. Armstrong.

No. 25 Squadron Standard

AT a ceremonial parade at R.A.F. West Malling, Kent, on June 21st, Air Marshal Sir Dermot A. Boyle, K.B.E., C.B., A.F.C., A.O.C-in-C. Fighter Command, presented the Squadron Standard to No. 25 (Night Fighter) Squadron. The Chief of the Air Staff, Marshal of the R.A.F. Sir William F. Dickson, who commanded the squadron in 1935, was to have

"Flight" photographs

AT THE BISLEY BUTTS during the R.A.F. Small Arms Association meeting. (Top, left) Marshal of the R.A.F. Sir John C. Slessor, Vice-Patron; Air Chief Marshal Sir Ronald Ivelaw-Chapman, President; and A. Cdre. G. Silyn-Roberts, Chairman. (Top, right) Firing for the Royal Air Force Rifle Championship on the final day of the meeting. (Lower, left) Sgt. Greenlee, winner of the Queen's Medal, is borne off the ranges in the traditional manner. (Lower, right) Marshal of the R.A.F. Lord Tedder, Vice-Patron, and Mr. George Ward, Under-Secretary of State for Air, who presented the prizes.

SERVICE AVIATION . . .

made the presentation, but was unfortunately prevented from doing so. The unit paraded in two flights commanded by the present C.O., S/L. J. Cameron Cox, and the Standard was borne by F/O. I. A. G. Svensson.

No. 25 Squadron has a distinguished history, as is shown by the battle honours they have selected for the standard; Western Front 1916-1918, Ypres 1917, Cambrai 1917, Somme 1918, Battle of Britain 1940, Fortress Europe 1943-1944, Home Defence 1940-1945, and France and Germany 1944-1945. It is at present equipped with Gloster Meteor N.F.12 and N.F.14 night fighters.

After the parade a reception was given in the Officers Mess at which A.V-M. the Earl of Bandon, A.V-M. Patch, A.O.C. No. 11 Group and the mayors of Rochester, Gillingham and Maidstone were present.

THE STANDARD of No. 25 Sqn. is presented to the Standard Bearer, F/O. Svensson, by Air Marshal Sir Dermot A. Boyle. With his back to the camera is the station commander of West Malling, G/C. P. H. Hamley.

R.A.F.S.A.A. Bisley Meeting

WITH the exception of the first two days, good weather attended the annual Bisley meeting of the Royal Air Force Small Arms Association.

Shooting was of a very high standard and the final stage of the competition for the Queen's Medal for the Champion Shot of the Air Forces was most exciting. In the first stage, with 181 points, S/L. Thomas had led and this lead he held in the second stage, until only the "rapid" and "snapshooting" remained to be decided. In the "rapid" another competitor put four shots on S/L. Thomas's target and, instead of demanding a re-shoot, Thomas accepted an average of the 14 shots. This worked out at 39.2, a point or two below what he might have expected from his own shots. In the "snapshooting" he complained, justifiably, of the target waving and demanded a re-shoot. To his mortification his score on the waving target turned out to be seven bulls and three inners, whereas on the re-shoot, which alone counted, he only got five shots on the target—two bulls and three inners. This final low scoring altered the whole finishing order, Sgt. C. H. Greenlee, of Ballykelly, who had been lying third—nine points behind—was placed first with 345, followed closely by Sgt. P. Lane-Joynt, of Honington, whose score was 344. Third was S/L. C. C. Willott, of H.Q. Technical Training Command, with 334.

Results of the other main competitions of the meeting were: *Revolver Championship.*—1st, W/C. R. F. B. Guy, Air Ministry (193 points); 2nd, S/L. C. C. Willott, H.Q. Technical Training Command (190); 3rd, F/L. W. A. Vasseur, Shawbury (187). *Rothermere Shield.*—1st, Flying Training Command (6088); 2nd, Maintenance Command (6047); 3rd, Home Command (6037). The winning station was Western Zoyland. *Command Rifle Team Match S.R.(a).*—1st, Home Command (1297); 2nd, Flying Training Command (1289); 3rd, Coastal Command (1278). *S.R.(b).*—1st, Flying Training Command (1092); 2nd, Technical Training Command (1086); 3rd, Coastal Command (1085). *Command Revolver Team Match.*—1st, Home Command (664); 2nd, Maintenance Command (660); 3rd, 2nd T.A.F. (657).

Station Team Matches. S.R.(a).—1st, Stafford (1228); 2nd, Hullavington (1223); 3rd, Coltishall (1215). 84 teams competed. *S.R.(b).*—1st, Kinloss (547); 2nd, Chivenor (545); 3rd, North Coates (543). 140 teams competed. *Revolver.*—1st, Coltishall (314); 2nd, H.Q. Technical Training Command (311); 3rd, Gosport (310). 42 teams competed.

Squadron Team Matches. Rifle S.R.(a).—1st, No. 63 Squadron (626); 2nd, No. 116 Squadron (603); 3rd, No. 661 A.O.P. Squadron (571). *Revolver.*—1st, No. 2 Squadron (194); 2nd, No. 500 Squadron (179); 3rd, No. 97 Squadron (164).

University Air Squadrons Match. S.R.(b).—1st, Nottingham (716); 2nd, Aberdeen (699); 3rd, Bristol (697). *R.Aux.A.F. and R.A.F.V.R. Challenge Cup.*—1st, Off. Cdt. K. G. Selby (133); 2nd, P/O. E. B. Wootten (132)—both of Nottingham University Air Squadron. *Light Machine-gun Match.*—1st, Sopley (155); 2nd, Patrington (141); 3rd, Chivenor (139).

F/S. S. Pickles (397) won the *Small Arms Efficiency Cup;* F/L. A. C. W. Smith (144) the *Rifle XX Match* and S/L. C. Laceby-Stevens (136) the *Old Comrades Match.* In the *Apprentices and Boy Entrants Match,* Halton No. 1 Wing (335) came first, but L.A/App. Hassell of Locking B Team, with a score of 92, had the highest individual score.

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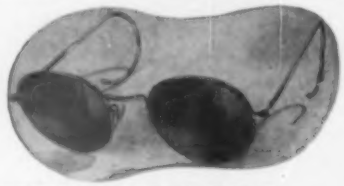

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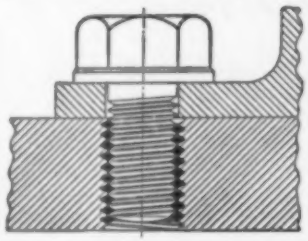

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PUBLIC ANNOUNCEMENTS

AIR TRANSPORT ADVISORY COUNCIL

THE Air Transport Advisory Council give notice that they have received the undermentioned applications to operate scheduled air services:—

APPLICATION No. 308. From Silver City Airways, Ltd., of 1 Great Cumberland Place, London W.1. For a combined all-freight and U.K. internal service with Bristol 170 and Dakota aircraft and later, possibly, with Blackburn Universal aircraft for the carriage of freight including vehicles, passengers and mail between Southampton (Eastleigh) and Guernsey, at a frequency of one service daily, increasing further according to demand, during the period from October 1st, 1954 to September 30th, 1961.

APPLICATION No. 92/2. From Hunting-Clan Air Transport, Ltd., of 5 Fitzhardinge Street, London W.1. For permission to include an optional traffic stop at Bergen either in addition to, or as alternative to, Stavanger on their normal scheduled service on the route Newcastle-Stavanger-Oslo-Stockholm (Application No. 92 and 92/1) approved by the Ministry of Transport and Civil Aviation.

THESE applications will be considered by the Council under the Terms of Reference issued to them by the Minister of Civil Aviation on July 30th, 1952. Any representations or objections with regard to these applications must be made in writing stating the reasons, and must reach the Council within 14 days of the date of this advertisement, addressed to the Secretary, Air Transport Advisory Council, 9 Buckingham Gate, London S.W.1, from whom further details of the applications may be obtained. When an objection is made to an application by another air transport company on the grounds that they are applying to operate the route or part of route in question, their application, if not already submitted to the Council, should reach them within the period allowed for the making of representations or objections.

THE Air Transport Advisory Council also give notice that the following application has now been withdrawn:—

APPLICATION No. 77/3. From Eagle Aviation, Ltd., of 29 Clarges Street, London W.1. For permission to include optional traffic stops at Strasbourg and Graz and at Linz as a possible winter alternative on their normal scheduled service between London and Belgrade, which was advertised in *The Times*, *The Aeroplane* and *Flight* on May 28th, 1954. [2251

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DETAIL DRAUGHTSMEN

for

work on highly important new Turbine Engine and Ramjet Projects.

Applicants should have experience in mechanical and/or sheet-metal details and preferably have reached O.N.C. or H.N.C. standard in mechanical engineering.

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Applications, quoting *E.D.4*, should be made in writing to **The Personnel Manager, The Bristol Aeroplane Co., Ltd., Engine Division, Filton House, Bristol.**

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SITUATIONS VACANT

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IMMEDIATE vacancies exist for fitter armourers, W.E.M.s, carpenters (A), clerks (G.D. and equipment accts.), fire fighters, equipment assistants, caterers and G.C.A. ops.

APPLICANTS, under 30 and preferably single, MUST be due for release from R.N. or R.A.F. within next three months or discharged within last 2 years.

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PAY scales: Cpl. £492-£600, Sgt. £660-£732, C/Sgt. £732-£822, W.O.1 £987-£1,095.

APPLY immediately for application forms and further details to Secretary, Rhodesia House, 429 Strand, London W.C.2. [2258

CHIEF INSPECTOR

REQUIRED for firm in the south of England manufacturing aircraft instruments and mechanical accessories. Applicants must be fully conversant with A.I.D. and A.R.B. procedure. The position is permanent with superannuation scheme. —Reply in first instance, giving full details of experience, age and salary required, to Box RG4365, A.K. Advertising, 212a Shaftesbury Avenue, London W.C.2. [2256

TECHNICAL ILLUSTRATORS

VACANCIES for senior illustrators, on airframe construction and installations.

PLEASE write, age, experience and salary expected to Personnel Supervisor, Hawker Aircraft, Ltd., Kingston-on-Thames, Surrey. [2237

MARSHALLS' FLYING SCHOOL, LTD., OF CAMBRIDGE

REQUIRE FOUR ADDITIONAL DRAUGHTSMEN OF AT LEAST INTERMEDIATE STANDARD FOR THEIR AIRCRAFT DESIGN AND DRAWING OFFICE AT CAMBRIDGE

APPLICANTS should have had some years' experience in the aircraft industry and at least be up to intermediate standard. These vacancies present good opportunities for young draughtsmen who prefer work of a varied nature on different types of modern service aircraft.

IN certain cases, assistance will be given with housing problems.

APPLY, with full details, to:

THE Personnel Manager, Marshalls' Flying School, Ltd., The Aerodrome, Cambridge. [2261

AERODYNAMICIST and a MATHEMATICIAN or PHYSICIST

ARE required for an expanding group engaged in research and development of guided weapons for work on non-linear mechanics. Applicants should have an honours degree and preference will be given to those with research experience.—Please write, with full details, to Personnel Dept. (ED/183) E.M.I. Eng. Dev., Ltd., Hayes, Middx. [2263

RADIO officer required for

NIGERIA, for one tour of 12/24 months in the first instance. Salary, etc. (a) In scale £750, rising to £1,175 a year with prospect of pensionable employment; (b) on temporary terms in scale £807, rising to £1,269 a year with gratuity at the rate of £100/£150 a year. Outfit allowance up to £60. Free passages for officer and wife and assistance towards cost of children's passages or grant up to £150 a year for their maintenance in U.K. Liberal leave on full salary. Candidates must have recent experience in operating wireless and direction finding ground stations for air services, and possess a P.M.G. certificate in radio telegraphy, an air operator's certificate, or equivalent service qualification. They must also have a thorough grounding in I.C.A.O. codes and procedures.—Write to the Crown Agents, 4 Millbank, London S.W.1. State age, name in block letters, full qualifications and experience and quote M2C/30648/FE. [2240

WORKSHOP foreman required for the

NIGERIAN BROADCASTING SERVICE for two tours of 15-18 months each in the first instance. Salary, etc., in scale £807, rising to £1,115 a year. Gratuity £100/£150 a year. Outfit allowance £60. Free passages for officers and wives. Assistance towards cost of children's passages or grants up to £150 annually for their maintenance in U.K. Liberal leave on full salary. Candidates should be experienced machinists, and familiar with all types of machine tools and with workshop organization. Ability to read circuit diagrams advantageous.—Write to the Crown Agents, 4 Millbank, London S.W.1. State age, name in block letters, full qualifications, and experience and quote M2C/30481/FE. [2241

METHODS and estimating engineer required for Planning and Contracts Dept. Tool making and costing experience essential. Aircraft experience. Sussex coast.—Box 6296. [2262

SENIOR draughtsman required with comprehensive experience of fuel and oil systems to initiate and take charge of section. Good welfare facilities including staff pension scheme.—Applications, in writing, to the Personnel Manager, Hunting Percival Aircraft, Ltd., The Airport, Luton, Beds, stating age, experience and salary required. [2224

AIRCRAFT DESIGN SUPERVISORS

Supervisory positions available in the design staff of a progressive and expanding Canadian Aircraft Company.

SECTION CHIEF— ELECTRONICS

Salary range: $9,000-$10,000 p.a.

Responsibility: Reports to Chief Design Engineer, determination of design policy, making major design decisions and the organization and direction of a team engaged in the design of radio, radar and electronics installations and systems for a broad field of military aircraft.

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Experience: Twelve years' experience, of which at least four years have been spent in a senior supervisory capacity, with modern military aircraft electronic systems. Experience in the field of anti-submarine installations is particularly desirable and other related experience will be evaluated in the light of its applicability.

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Education: Engineering degree or Higher National standard in mechanical engineering.

Experience: Ten years' experience, of which at least three should have been in a recognized supervisory capacity, in the field of gun turret, bomb and rocket systems and installation. Experience in the field of anti-submarine aircraft is desirable and other related experience will be evaluated in the light of its applicability.

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Letters of application should include complete details of your education and experience and at least three references.

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c/o The Canadian Department of Labour

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Please mark application "SUPERVISOR"

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AIRWORK GENERAL TRADING Co., Ltd., have the following vacancies for staff to be employed at Blackbushe Airport.

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(1) Licensed inspectors and engineers with Hermes and/or Bristol Hercules endorsement.
(2) Licensed electrical inspectors and engineers with category X endorsement.
(3) Licensed radio engineers with category A endorsement.
(4) Licensed instrument inspectors and engineers with category X endorsement.

INDUSTRIAL staff:

ENGINE fitters, airframe fitters, aircraft electricians, instrument mechanics, and radio mechanics.—Write, in first instance, to Service Manager, Airwork General Trading Co., Ltd., Blackbushe Airport, Camberley, Surrey, with details of qualifications, etc. [2215

A YOUNG man is required as assistant to the works manager of a large aircraft engineering works near Blackpool.

APPLICANTS should be 23-30 years of age and o exceptional resourcefulness and initiative. Education must be to the standard of a Higher National Certificate in mechanical or production engineering, preferably including industrial administration subjects. Practical workshop experience is essential.

THE post offers unique opportunities for a suitable candidate. Salary commensurate with age, qualifications and experience. Write, giving age and full particulars to Box 6093. [2220

ELECTRONICS examiners are required by the Ministry of Supply for work in the Greater London area.

APPLICANTS must have had several years skilled experience in modern electronics technique either in industry or H.M. Forces. Rate of pay for a 44-hour 5-day week, 175/10 to 187/10 with the possibility of advancement to 197/10.—Applications, giving details of experience, should be forwarded to Administrative Officer (Labour), Inspectorate of Electrical and Mechanical Equipment, "Aquila," Golf Road, Bromley, Kent. [2237

AIR MINISTRY requires men as temporary wholetime observer officers in Royal Observer Corps. Prospects of promotion and permanency.

LECTURING ability and experience in office organisation and control essential. Interest in aviation, particularly aircraft identification, desirable. Candidates must be prepared to serve anywhere in the U.K. Minimum age 21 on June 1st, 1954. Salary scale (London) £511 to £592, rather less outside London. Scale under review.—Apply, preferably by postcard, to Air Ministry, (S.5(g)), Cornwall House, (O.B.15), Stamford Street, London S.E.1. Application forms to be returned by July 23rd, 1954. [2250

AIRCRAFT accessory manufacturer requires senior bearing research scientist for new section covering use of gas and antifriction bearings operating at speeds up to 150,000 r.p.m.—Write Box 6277. [2249

TECHNICAL MANAGER required, with knowledge of chemistry and rubber technology, by aircraft firm in south of England.—Reply, stating details of qualifications and salary required, to Box 6275. [2248

LICENSED ground engineer wanted for club and private aircraft maintenance on the south coast. "A" and "C" licences required on Messenger, Magister, Gemini and Aerovan.—Box 5830. [0345

STARAVIA, Blackbushe Airport, Camberley, Surrey, require a licensed engineer to take over chief inspector and other interesting general duties (preferably Category X Electrical but other categories considered). [2231

MATHEMATICIANS. Vacancies occur in technical offices of Design Dept. for men with degrees in mathematics.—Please write, The Personnel Supervisor, Hawker Aircraft, Ltd., Canbury Park Road, Kingston-on-Thames, Surrey. [2234

SENIOR and intermediate design draughtsmen, with good experience of aircraft or light structural or mechanical engineering, required for aircraft and armament project work.—Apply, by letter, to Portsmouth Aviation, Ltd., The Airport, Portsmouth. [0612

RADIO engineers, fully licensed in both "A" and "B" categories, are required by the servicing division of Field Aircraft Services, Ltd., Bovingdon Airport, Herts.—Applications, showing full details of experience, licences and salary required, should be addressed to the Manager. [2239

SEVERAL senior draughtsmen with experience of turbine engine installations required immediately for both fixed and rotating wing installations. Good welfare facilities including staff pension scheme.—Applications, in writing, to the Personnel Manager, Hunting Percival Aircraft, Ltd., The Airport, Luton, Beds, stating age, experience and salary required. [2223

SENIOR aircraft design draughtsman with experience of airframes or engine installations required by a London firm of design consultants to co-ordinate design projects with clients. Applicants should preferably be single or at lease free to travel. This is a permanent position offering scope, and carries a generous salary for the right type of man.—Write to Box 6249. [2245

BRITISH EUROPEAN AIRWAYS require a flight test engineer in their Project and Development Branch at London Airport. Practical aircraft engineering experience, including flight test work, essential. Engineering degree or equivalent knowledge of aircraft performance and piloting experience desirable. Salary within the scale £645-£785 or £695-£875 p.a., according to experience and qualifications.—Applications, giving full details, to Senior Personnel Officer, B.E.A. Engineering Base, London Airport, Hounslow, Middlesex. [2260

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(b) **TECHNICAL INSTRUCTOR** (electrical) for Aircraft Servicing School; must have had good technical training, sound practical experience in the maintenance of modern aircraft, and be capable of lecturing, drawing instructional diagrams and compiling lecture notes for the use of students.

(c) **SENIOR AND INTERMEDIATE WEIGHTS ENGINEERS,** with aircraft experience, for employment at HURN depot, nr. Bournemouth.

(d) **DRAUGHTSMEN,** for design modification and detail work on modern aircraft, at HURN depot, nr. Bournemouth and main WEYBRIDGE Works; experience on aircraft not essential, provided practical and academic qualifications are suitable.

(e) **INSPECTORS/VIEWERS** to cover work on aircraft finals, and in Tool Room, Tinsmiths and Sub-assemblies Shops; also to inspect many other branches of production and development work.

(f) **FITTER-ERECTORS,** skilled or experienced semi-skilled, on aircraft preparation for flight work at Wisley Aerodrome; also production in main Erecting Shop at Weybridge.

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Applicants should be in a position to arrange their own housing accommodation. Assistance can only be given with individual lodgings.

SITUATIONS VACANT

H. M. HOBSON, Ltd., invite applications for positions in the drawing office as follows: designers, detail and modification draughtsmen, checkers, stressmen. The work is concerned with interesting projects connected with fuel metering equipment and hydraulic flying controls for aircraft.—Hobson Works, Fordhouses, Wolverhampton. [0420

HANDLEY PAGE (READING), Ltd., The Aerodrome, Woodley, Reading, have vacancies in their design office for senior and intermediate draughtsmen, weightsmen and loftsmen. The work is on an interesting new project and there is scope for rapid advancement to suitable applicants.—Please send full particulars, etc., to the Personnel Officer. [0235

TECHNICAL artist required for illustration of technical instruction manuals on aeronautical instruments and equipment. Must have previous experience and be able to prepare perspective drawings from manufacturing prints. Engineering training and experience in retouching preferable. Good salary appropriate to experience. Pension scheme.
APPLY, with full details of experience, salary range and samples of work, quoting No. 1487, to Personnel Manager, Sperry Gyroscope Co., Ltd., Great West Road, Brentford, Middlesex. [2205

ARMSTRONG SIDDELEY MOTORS, Coventry, have vacancies for a number of designers and senior and junior draughtsmen. Although gas turbine experience is most advantageous it is not necessarily essential as training will be given in this specialized work to suitably qualified draughtsmen.—Apply, in detail to Reference F.103, Personnel Manager, Armstrong Siddeley Motors, Coventry. [0200

TECHNICAL illustrator (senior) required, with considerable practical experience of illustrating for descriptive manuals, brochures, etc. Ability to produce first-class perspective and half-tone illustrations from workshop drawings. State experience, age and salary required.—Apply, in writing, to Personnel Manager, Flight Refuelling, Ltd., Tarrant Rushton Airfield, nr. Blandford, Dorset. [2232

DEVELOPMENT engineer required to form research and development department of company engaged on work of national importance. British by birth. Education to at least H.N.C. standard essential. Some knowledge of explosives desirable but not as essential as broad outlook, initiative and enthusiasm.—Applications, stating full details of past experience and salary required, to the Managing Director. Box 6023. [2229

DESIGNER with experience of gas turbines and a sound knowledge of thermo dynamics required to take charge of newly-formed department building turbo-compressors under licence. A high salary will be paid to man with exceptional qualifications and proved ability. The post is permanent with pension scheme and offers excellent prospects.—Apply, giving age and full details of experience, to Box 6274. [2247

BRITISH EUROPEAN AIRWAYS require a radio maintenance engineer in Jersey. Should hold R.M.E. licence to "A" category with "A" rating. Desirable have up-to-date experience on modern aircraft fault diagnosis/rectification; knowledge of up-to-date civil radio communications landing/navigation aids. Salary £11/5/0-£13/10/6 per week.—Applications, with full details of age, qualifications and experience, to Senior Personnel Officer, Traffic Dept., B.E.A. Keyline House, Ruislip, Middlesex. [2257

SENIOR stressman for important and interesting work in the civil and military spheres of aeronautical engineering, embracing turbines for aircraft air conditioning, accessory installations, turbo-props, small high-speed turbines and blowers. Applicants should be of degree standard with at least three years experience in engine or allied fields. (Ref. 70.)—Write in detail or send postcard for Application Form, quoting reference number, to: Personnel Manager, de Havilland Propellers Limited, Hatfield, Herts. [2242

EXPERIENCE graduate mechanical engineer required to re-design for production precision oil hydraulic and light mechanical equipments for servo mechanisms. Previous experience in designing for production comparable equipment is essential. If not already familiar, applicants should be willing to study the theory, practice, and problems peculiar to closed-loop control systems.—Applications, in writing, to Personnel Manager, Metropolitan-Vickers Electrical Co., Ltd., Trafford Park, Manchester 17. [2243

ASSISTANT chief engineer required by company engaged in the design and development of guided weapons. Candidates must be mechanical engineers with first class qualifications and experience in electronics and light engineering. Knowledge and experience in servo mechanisms essential since duties would include responsibility for missile control systems, electrical gyros, accelerometers, etc. Applicants should be 30-35 years of age and have sufficient personality and experience to administer and organize the development activity on these subjects.
WRITE, in detail, quoting reference "G," to Box AC91033, Samson Clark, 57-61, Mortimer Street, London, W.1. [0562

PRODUCTION manager required. Position requires a man with vast aircraft engineering experience, organizing ability and drive; capable of taking responsibility for production services, i.e. planning, progress, stores, sub-contracts, etc., but not the actual production from the factory floor. Applicants must have held similar position in the industry for some years. Good prospects with pension scheme.—Applications to be made, in writing, to the Personnel Manager, Hunting Percival Aircraft, Ltd., The Airport, Luton, Beds. [2227

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capable of carrying projects through from conception to completion.

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The company's programme offers excellent prospects of permanent interesting employment under congenial working conditions.

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DESIGNERS

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These appointments are pensionable and offer good prospects to individuals with initiative and technical ability.

Applications giving details of experience and qualification to

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Pilots and Flight Engineers

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SITUATIONS VACANT

SENIOR scientific officers, scientific officers, patent examiner and patent officer classes. The Civil Service Commissioners invite applications for pensionable appointments. Applications may be accepted up to December 31st, 1954, but early application is advised as an earlier closing date may eventually be announced. Interview Boards will sit at frequent intervals. The scientific posts cover a wide range of scientific research and development in most of the major fields of fundamental and applied science. In biological subjects the number of vacancies is small: individual vacancies exist at present for candidates who have specialized in palaeobotany, foraminifera, malacology and lichenology. The patent posts are in the Patent Office (Board of Trade), and Ministry of Supply.

CANDIDATES must have obtained a university degree with first or second class honours in an appropriate scientific subject (including engineering) or in mathematics, or an equivalent qualification; or for scientific posts, possess high professional attainments. Candidates for senior scientific officer posts must in addition have had at least three years' post-graduate or other approved experience. Candidates for scientific officer and patent posts taking their degrees in 1954 may apply before the result of their degree examination is known.

AGE limits: Senior scientific officers, between 26 and 31, but specially suitable candidates under 26 may be admitted. For scientific officers and patent classes, between 21 and 28 during 1954 (up to 31 for permanent members of the experimental officer class). Salary (London) senior scientific officers (men), £975 to £1,150; (women) £845 to £1,025. Scientific officers (men), £470 to £855; (women) £470 to £750. Patent examiner and patent officer classes (men), £440 to £760 (rates under review). Women's rates somewhat lower. Somewhat lower rates in the provinces.

FURTHER particulars from the Civil Service Commission, Scientific Branch, Trinidad House, Old Burlington Street, London, W.1, quoting No. S.53/54 for senior scientific officers and S.52/54, S.128/54 for the other posts. [2238

SITUATIONS VACANT

FIRST-CLASS senior stressmen required for South of England company. Must have sound engineering experience. New houses to rent available. Salary in the range of £800 to £1,000 p.a. in accordance with age and experience.—Please send full particulars, etc., to Box AC88922, Samson Clarks, 57-61 Mortimer Street, W.1. [0236

MINISTRY OF SUPPLY requires technical publications officer at Chessington to assist manufacturers to prepare instruction books on servicing, ground handling, repair of military aircraft, power units, etc. Qualifications: British of British parents. Recognised engineering apprenticeship. O.N.C. or equivalent desirable. Appropriate practical experience. Knowledge Service methods advantageous. Salary within £650 (age 30)-£761. Not established but opportunities to compete for establishment may arise.—Application forms from AB.393, London Appointments Office, Ministry of Labour and National Service, 1-6 Tavistock Square, W.C.1. [2259

DRAUGHTSMEN required, by Ministry of Supply at various locations, with experience in any of following classes of work: chemical plant, light or heavy mech., automobile, precision instrumentation, radio, radar, electrical, electronics, structural, building, jig and tool. At least three years workshop training and O.N.C. or equivalent. Starting pay (provincial)—£360 (aged 20)-£550 (age 28), rising to £640. London rates higher. Paid sick leave. 20 days annual holiday plus public holidays. 44-hour week (generally 5-day) including meal breaks. Payment for overtime. Appointments unestablished but opportunities to compete for pensionable posts. Prospects of promotion to Leading Draughtsman, £635-£742 (prov.), thence to Senior Draughtsman, £742-£910 (prov.) and Chief Draughtsman, £961-£1,120 (prov.).—Write, stating age, training, quals. and experience to Ministry of Supply, Est.3(c)1, Room 519, Carlton Hotel, Haymarket, London S.W.1. [2236

SITUATIONS VACANT

HUNTING PERCIVAL AIRCRAFT, Ltd. urgently require qualified technical illustrators for work on A.M. publications. Good welfare facilities, including staff pension scheme.—Applications, in writing, to Personnel Manager, Hunting Percival Aircraft, Ltd., Luton Airport, Beds, stating age, experience and salary required. [0592

LOCUST OFFICER (part-time flying duties required) by the Desert Locust Control, East Africa High Commission, for one tour of 24-28 months in the first instance. Salary £550, rising to £690 a year. Cost of living, hard living and flying duty allowances payable. Free rations. Outfit allowance, £30. Free passages and liberal leave on full salary. Gratuity 13½ per cent. total basic salary. Candidates must possess a current commercial or private pilot's licence.—Write to the Crown Agents, 4 Millbank, London S.W.1. State age, name in block letters, full qualifications and experience and quote M3A/33697/FE. [2244

SITUATIONS WANTED

COMMERCIAL Pilot, 27, R/T. 1,800 hrs Auster, Tiger, DC-3, Grp. 2 ex-instructor, airline, requires flying position.—Box 6276. [2252

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WANTED. Scrap Mercury, aircraft plugs, contacts (new or used), copper, brass and all non-ferrous and scrap precious metals in any form.—Belgrave Buyers (F.), 5 Belgrave Gardens, London N.W.8. MAI. 7513. [2255

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with the following specialized experience:—
SENIOR DESIGN DRAUGHTSMEN—experienced in aircraft structures for experimental conversion work for flight tests.
SENIOR ELECTRICAL DRAUGHTSMEN—for work on aircraft conversions and development of Napier Electrical De-icing system.
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PLANT DRAUGHTSMEN—Several years' experience desirable on factory layout, building modifications, services, survey, structures and machine tools.
The above are posts of responsibility for which good salaries will be paid to really experienced men. Applications in the first place to:—
Central Personnel Services,
Marconi House,
336-7 Strand, W.C.2,
quoting Ref. 1346.

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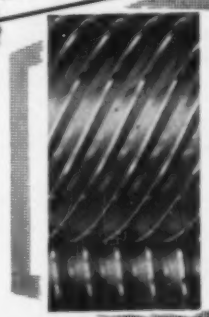

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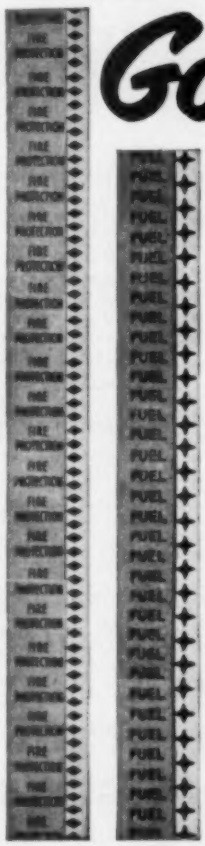

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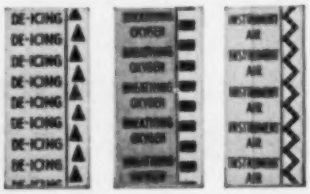

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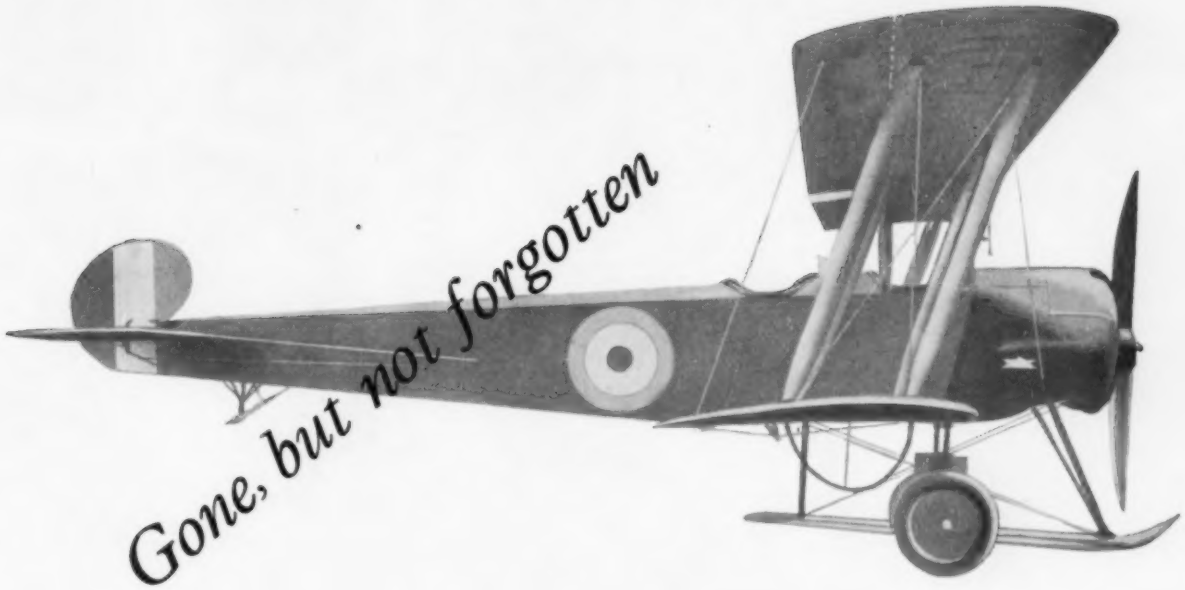

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